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Small Plant Uses High-Priced Men

Figures Economy in Applying Skill to Every Job—Less Supervision Needed—Modern Tools Employed

EMPLOYMENT of highly skilled machinists in all departments, even though the labor cost is thereby increased, has proved to be economical at the plant of the Schmutz Mfg. Co., Louisville, Ky., maker of sheet-metal printing machines and of special printing machines for all purposes. Since each job differs from every other, so that standard routing of material is impossible, except in the building of its standard line, the company has worked out successfully a cooperative system of handling the manufacturing problem peculiar to each special printing unit constructed. Furthermore, the wisdom of equipping a small plant, employing an average of 50 men, with modern labor-saving machine tools already is shown in lowered production costs.

Every workman associated with the company has had long training as a machinist. One requisite demanded of a man who applies for a position is ability to operate intelligently practically every standard kind of machine tool. It is not this technical knowledge alone, however, which is essential; he must possess sufficient initiative to work out problems without calling upon his foreman or the general manager to lay out a plan for him to follow.

Consequently, he is able to erect the jigs and fixtures for each job and knows what function each machine tool fills. In addition, he has an intimate conception of what each special machine will look like when it is completed, for what purpose it is to be used, and how it operates. Under the circumstances, it is

Each Machine Is Driven by Belt, Having Its Own Motor. Note hanging jib crane at upper right and mercury vapor lights

Small Switchboards on Columns Alongside the Assembly Floor Provide Power Taps within 25 Ft. of Any Point Where Power May Be Needed

little wonder that each employee is capable of holding the position of foreman in the average metal-working shop.

Men Follow Jobs Through

Whenever production of a special machine is ready to begin, two or three workmen are assigned to that particular job, to stay with it until it is ready for delivery to a customer. A conference is called by the general manager, with the foremen, workmen, and any other interested parties sitting in. At this meeting the various problems involved in building the machine are discussed from all angles, with the result that everyone concerned has a thorough understanding of all operations when the work of construction actually starts.

Suggestions are welcomed at these conferences and, by discussion, any difficulties which may be confronted are ironed out. The cooperative spirit which such meetings engender is an important factor in bringing about a most desirable teamwork.

The first conference is followed by others at various intervals. No set plan is adhered to, but the men get together at a roundtable session whenever new problems arise which require prompt solution. Therefore, when a machine is completed, each man feels that he has contributed something worthwhile to its manufacture.

In making its products the company purchases rough castings, but does all the machining operations in its own plant. This policy obviates the necessity of a workman performing a routine task for any considerable length of time. Should a special case demand a monotonous repetition of work over an extended period, however, the workman is relieved by another at the end of three days.

Belt Drive from Individual Motors

All machine tools are of standard design, but some have special attachments. Each machine is belt driven, with power supplied by an individual motor mounted overhead.

The manner in which electrical power is distributed simplifies the task of providing electricity for any new machine tool which may be installed in the future. On each of four columns at the side of the assembly

Each Workman Assigned to a Job Stays with It to Completion. This includes both machining and assembling

floor is a switchboard into which conduits run. This arrangement makes it unnecessary to extend wire further than 25 ft. to any point in the shop. It also provides for speedy setting up of new tools.

Each tool, having its own motor, is controlled by an electric switch within easy reach of the operator. The regular shifting lever is, of course, provided also, so that it is not necessary for the operator to cut out his motor when stopping and starting the tool, if this must be done at frequent intervals.

When a new machine, or tool, is added to the equipment, it is only necessary to spot the machine, mount the motor and countershaft overhead, attach belts and hook up with nearest Allen-Bradley starting box.

A light, hand-operated crane serves the assembly floor.

Illumination is by means of the Cooper-Hewitt lighting system. A sufficient number of these tubes are installed to give almost daylight conditions at night. Two or three tubes are arranged on each circuit, controlled by an individual circuit switch, with a master switch controlling the entire installation. By this arrangement one circuit can be lighted independently of all the others. During the short winter days, when darkness comes on before quitting time, or when a night shift is on duty, the entire factory can be lighted from the master switch.

Keeping Track of Parts and of Costs

For replacement and repairs, a complete record of all parts of each special machine manufactured, as well as the standard products, is kept on file. In this way customers may readily obtain any parts which they may need.

Labor costs are easily ascertained by computing the time each man spends on a job. His time card reveals this information, and the fact that certain men are assigned to certain machines, from the moment production starts, until it is completed, further simplifies the matter.

Here, then, is a small plant, in which the most modern equipment has been placed. No used tools have been purchased and no antiquated methods are being used to cut down initial costs, with the false idea that in the end a monetary saving is effected. In addition, as has been pointed out, only the highest type and best-paid labor is employed, machinists' positions being at a premium. Beneficial results have been seen almost from the very beginning of this company's operation in its new plant, to which manufacturing was removed only a few months ago.

Relative Industrial Furnace Economies

Electric Furnaces Discussed, With Both Heating Cost and Incidental Factors Considered

BY CARL L. IPSEN AND ALBERT N. OTIS*

IN the selection of furnaces, and particularly when comparing electric with combustion furnaces, the electricity and fuel costs, being readily obtainable, are often used as the sole basis of comparison. While this may be correct in some cases, in many cases, particularly where products of relatively high unit value are involved, the cost of heat for processing them is only a small portion of their value, and any incidental advantages which could be realized by a choice of heating means, might be of far greater importance than the difference in the cost of heat.

Therefore the consideration of the other factors involved, and the possibilities which the electric furnace offers as regards location, to reduce the amount of handling and trucking, the amount of material in process, improved quality, increased output, reduced cost of subsequent operations, such as machining, pickling, etc., may show that savings much greater than the entire heating cost may be realized.

One outstanding characteristic of electric furnaces is that they are noiseless and clean. They emit no gases of combustion, dissipate comparatively little heat to the surrounding atmosphere, have uniform heat distribution within the chamber, are capable of accurate temperature control, cannot of themselves explode under any circumstances, and are attended by greatly reduced fire hazard.

These characteristics are particularly of value when it is desired to locate the furnaces in the line of production with other machinery where fuel furnaces could not be permitted. They are important from the standpoint of the operator as affecting his comfort, health, safety and personal efficiency, as well as from the standpoint of the management, in producing a uniform or high-grade product, with few rejects or retreatments. They also permit a great output per employee and per unit of floor space.

Electric furnaces are constructed with a tightly closed chamber, so that air cannot circulate. The only loss, therefore, is through the walls. As they can be well heat insulated, electric furnaces operate at a high thermal efficiency. The table gives calculated maximum thermal efficiencies of furnaces at three usual working temperatures.

CALCULATED FURNACE EFFICIENCIES
(Percentages)

Temperature and Typical Service	Electricity
400 deg. Fahr., Baking	90
1600 deg. Fahr., Annealing	83
2300 deg. Fahr., Forging	76

However, thermal efficiencies and base fuel cost are often of minor importance in view of the other factors involved, as we are interested only in the final cost of doing the work. Coal will furnish more heat units per dollar than any other generally available fuel, but it is not burned in industrial furnaces to any great extent. Fuel oil costs more per heat unit, and gas still more, but they are used in preference. The tendency has, therefore, been toward higher priced fuels. Obviously, greater overall economies are secured, or their use would not be justified.

Electricity has the highest cost per heat unit of any of the commercial fuels, but by liberal use of heat insulation the losses are reduced to such an extent that the electric furnace assumes the nature of a fireless cooker. For this reason a given temperature can be maintained in a furnace chamber by electric heat at as low a cost (or lower) as with other industrial fuels.

For such purposes as annealing and carburizing, electric furnaces can be operated at night without attendance, and often reduced power rates can be secured for such service. These facts are taken advantage of in many cases to reduce further the cost of these operations.

Viewed broadly, therefore, the cost of heating, as such, whatever means may be employed, is of minor importance as affecting the cost of the product. The advantages of improved quality, reduced cost of subsequent operations, saving in labor for attendance, handling, etc., are of far greater importance than the *total cost* of heat, to say nothing of the *difference* between the cost of fuel and that of electric heat.

*General Electric Co., Schenectady, N. Y. This is abstract of a paper read Sept. 1, at Toronto, at the Varsity Arena Steel and Power Show.

Better Conditions, Better Founders

While the Human Problem Is Being Worked Out, Progress Would Be Faster with a Definite Training Program

BY C. J. FREUND*

THE foundryman who is confronted with a choice between accepting a pattern at a considerable loss or restricting the operation of his plant and disbanding his organization, or a part of it, is likely to believe that he has a serious and difficult problem on his hands. And he has. But every foundryman is constantly face to face with a problem still greater than this. I refer to the human problem.

It is true that very few understand the man problem or take it seriously, because it does not clamor for instant solution as most other problems do. When a superintendent is lost to an organization for some reason or other the next man in order is promoted to the position or an outsider is engaged. The new incumbent may be far from an ideal superintendent; but there is nothing to do except to make the best of conditions. If it is impossible to hire molders, those who are in the shop are overtaxed to get the work out and the managers turn their thoughts to other matters.

Should foundrymen solve this great problem—or come as near as possible to solving it—they would find that most of their smaller problems would disappear, for the reason that a better class of foundrymen would be more efficient and more intelligent and would prevent those conditions from which foundry problems arise. More capable and more conscientious men would mold better and melt better and pour better and would perform all their various tasks more carefully. Waste of material, scrapped work, accidents and other costly features of foundry operation would be greatly reduced.

Marked Improvement in Twenty Years

Although the human problem in the foundry remains unsolved, great strides have been made in the last twenty years or more. In the foundry industry, possibly more than in any other, there is a close relation between shop conditions and the type of men in the industry. The foundryman type has improved greatly since the beginning of the present century but this improvement has been the result rather of improved foundry conditions than of any deliberate attempt at human improvement by foundry managers.

In spite of notable exceptions, the foundry industry was considered to be somewhat disreputable, 20 years ago. The dirtiest shop in the dirtiest part of any town was certain to be the foundry. The foundry department of every large plant was the most neglected department and very often a positive eyesore. Visitors to the plant were taken through all other departments, but the foundry was passed up with a jerk of the thumb and an explanatory "the foundry."

The building was likely to be an old frame structure, twisted out of shape, with a leaky roof and windows either broken or opaque with the accumulated dirt of as many years as the building was old. A creaky wooden jib crane swung the ladle away from the cupola and the metal was carried thence by hand or, in the larger shops, by means of a wobbly, narrow-gage track. The men were what one should expect to find in such a place. The molders were rough and dirty and often drunken. Foremen were little better. The foundry owner or manager sometimes was of the same type, only more intelligent. Frequently he announced that people were interested in the quality of the castings he made and not in the cleanliness, or lack of it, of his clothing.

Under the circumstances, it was but natural that parents, teachers and others should discourage young men from going into foundry work. The inevitable result was that very few boys took foundry work seriously as an occupation and most of the ordinary molders were floaters.

Mechanical Progress Most Marked

It was inevitable that most of such foundries should disappear. As the mechanical industries were developed, the specifications of customers became more stringent. Foundrymen were required to make metal with certain chemical and physical properties. The demand for mere "cast iron" disappeared almost entirely. Stricter requirements had to be met by improved facilities and more capable men. Chemists and metallurgists became active in foundry operations and frequently took charge and became practical foundrymen. Foundry associations were formed and began to affect the industry in that they emphasized its professional or occupational aspects. The invention and application of new equipment and appliances likewise affected the industry favorably. Compressed air and electricity destroyed most of the drudgery of ramming molds and hoisting materials. The crane ladle did away with much of the hand pouring. Mechanical sand mixers and mills took the place of hard physical work. Laws were passed regulating industrial safety and sanitation and factory inspectors accomplished wonders, although the average foundryman would not admit it.

All these influences have combined to bring about an improvement of conditions in the foundry industry greater, probably, than in any other. The modern casting shop is so different from that of twenty years ago that the layman would hardly recognize any similarity between the two. We visited such a shop a short time ago. It was by no means a new foundry as it was at least ten years old. However, it was a splendid place to work, although not really different from any modern foundry. A great number of windows, which were cleaned at regular intervals, provided sufficient light for all purposes. Adequate natural and artificial ventilation kept the air clear even while the molds were being poured. Cranes, hoists and conveyors handled all materials efficiently and rapidly. Shaking out, chipping and blasting were done in separate departments splendidly equipped for the work. Well equipped locker and wash rooms were provided for employees. Storage and scrap yards extended from the rear of the building only and the exterior appearance of the shops was not only inoffensive but even attractive.

New Personnel at Foundry Conventions

This inevitable improvement in foundry conditions has introduced to the industry a much higher type of foundryman. Nowhere does this change for the better in personnel appear to better advantage than at the annual conventions of the foundry associations. Veteran foundrymen, who have for years stood out above their fellows and have attended these meetings regularly, have complimented the associations upon the splendid class of men who now represent the casting industry.

The foundrymen of the present time can be divided into three principal classes, all desirable. There is, in the first place, the old type of foundryman who has survived but retains many of his original character-

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istics. There is the foundryman of the old type who has adjusted himself fully to the new order of things in the industry; and there is finally the newest type, a younger man, who has been trained by modern methods under modern conditions.

The foundrymen of the first class are almost invariably the reliable, expert workmen of their respective organizations. They grumble a little at the new state of affairs and deplore the passing of "the good old days," although they admit in their own minds that they would not wish the "old days" to return. Although they take no part in the administrative phase of foundry affairs, their skill makes them invaluable. Their cooperation is satisfactory, in fact, if not always in attitude, and every superintendent laughs at them, is irritated by them and would be lost without them

Men Who Have Changed

The second class of foundrymen are those who saw the handwriting on the wall years ago and spared no effort to become familiar with modern practice. They include most of the foremen and superintendents in the business. They understand the old workmen and have their respect because they grew up in the work with them. At the same time, they understand management methods and have learned to keep step with the tremendous stride of modern manufacturing. They are the backbone of the foundry industry.

The third class is made up of the young men who have gone into the business deliberately, have made foundry work their profession and have learned it systematically. In point of numbers, this third class is the least important group of the three. They are the most important, on the other hand, because no other class of foundryman is being produced today. The time will come, judging from appearances, when all foundrymen will belong to this class. A few such men have already reached high positions in the industry, and others are destined to do likewise. They are the college, high school and apprentice graduates, the most romantic figures in the foundry world.

The foundryman has redeemed himself in the communities. Much of the prejudice against the industry has disappeared and what remains is no longer justified but is merely a remnant of former times. Foundry work has come to be acceptable to parents and guardians, as well as to boys, and foundry courses are now offered in many of the trade schools. Also, within the manufacturing establishment the foundry has come into its own and its superintendent has been given his proper place, now ranking with the superintendents of the machine shop and other departments.

It is clear that the human problem of the foundry industry has been partly solved. It is equally clear that this partial solution has been the result of changed conditions more than of deliberate effort. Nothing the American foundryman can do will go so far toward the ultimate working out of his ordinary, routine problems as the building up of a generation of foundrymen of a high caliber.

Experience has shown that foundrymen improve with the improvement of foundry conditions and it behooves foundrymen not merely to maintain conditions as they are now but to improve them continually. Moreover, why should not the foundryman take definite steps toward training young men for his industry? If superior working conditions alone have accomplished so much, what will not be the effect of organized training programs? If mere circumstances have developed the foundryman, what may be expected of apprenticeship? The movement is already under way. In Pittsburgh and Philadelphia, in Boston and in Providence, in Newark, in Birmingham, in Wilmington, in Erie and in San Francisco, in Chicago and Detroit, in Milwaukee and in the Tri-Cities, foundrymen have organized for apprentice training. When the entire American foundry industry joins them in this work a new era will have dawned for those who make castings.

What Founders Learned at Paris Sessions

Conclusion of the International Foundry Congress and Exhibition Leaves Many Impressions of New Methods

PARIS, FRANCE, Sept. 26.—Now that the International Congress and Exhibition of Foundrymen has come to an end, it is possible to sum up what was learned at the sessions and exhibit. As regards improvement in quality of iron and steel castings, exhibits showed that additions of manganese, nickel or chromium are now current practice.

Testing methods has been the most debated question of late years in all foundry congresses. It has definitely been proved that tensile stress tests should be given up and replaced by shearing tests, and that, on the other hand, impact tests cannot escape inaccuracy through many errors. The shearing test by punching, instead of mere shearing, which is recommended by certain authors, seems likely to increase the causes of errors.

With regard to the divergences in the choice of the diameter of balls to be used for ball tests, it has been found that it is advantageous not to reduce too much the diameter of the imprint, as, the larger that diameter, the less the relative error. Agreement has still to be reached concerning the type of bending test piece to be adopted: American bar, German bar, or French test piece of Frémont.

It was made clear that heat treatment of cast iron has no other usefulness than to soften the metal. For that purpose it is even necessary that temperatures adopted be not arbitrary, and be directed by the use of the Chevenard dilatometer, for instance.

Electric Furnaces to the Fore

Solution of the problem of melting tends progressively toward utilization, always more extended, of the electric furnace. The duplex process is not to be lost sight of. As to the furnaces themselves, the revolving arc furnace seems to have a good prospect.

Molding methods remain about the same. More and more one aims at automatism, to reduce the molder's movements to a minimum, as may be observed from the machines on show: sand molding blast machine and tilting, hinged molding machine. The use of compressed air as motive power has become more general. Continuous work has now many supporters and a continuous molding machine for serial molding of low-relief parts is, from that point of view, interesting.

Sands Received Much Attention

After testing methods, the question in the iron foundry which has perhaps been the most investigated is that of the constitution and preparation of sands. Italians recommend a synthetic preparation of sands. The automatic sand machines are characterized as "universal."

Sand throwing or combing machines are in favor. The sand blast apparatus has made great progress also. We note a propensity of constructors to avoid appliances prone to wear easily and to replace, in some cases, the circular movement of parts for the dissemination of sand by an alternative or elliptical movement.

Non-Ferrous Metals in New Uses

In non-ferrous alloys, as for gray cast iron, a generalized tendency to replace common alloys by special alloys (aluminum bronze, bronze and brass, with addition of nickel and manganese) is to be noted. The study of such alloys has made great progress, thanks to macrography which, in these cases, may take the place of micrography, and furnishes valuable and useful indications on the texture of the tested piece at various points.

Considerable progress has been made in the preparation of light aluminum alloys. Studies on the melting of these alloys have been pushed far ahead and it has been possible to attain results which permit us to foresee their application not only in the aeronautical industry, but also in the construction of railroad rolling stock and in the chemical industry.

More Countries Now Making Steel

This Means a Reduction in Overseas Shipments and Hence a Sharpening of Export Competition—Home Demand Growing in United States and in Europe

BY PAUL M. TYLER

A STUDY of the shifting currents of the world's iron and steel trade reveals a well-developed trend toward a reduction in overseas shipments. In the United States, steel consumption has advanced by leaps and bounds and still moves steadily upward. In Europe, likewise, as industry slowly resumes its normal course, consumption seems to be again on the increase. As compared with conditions in 1913, the leading steel producing countries—the United States, Great Britain, Germany, France and the Belgo-Luxemburg union—all find home trade on a larger scale now than before the World War.

Their aggregate export trade, on the other hand, is smaller. South America, Oceania, Africa, and even Canada imported less steel in 1926 than in 1913. In Asia, though the general situation is more confused (because of variations in different countries), the losses all but exceeded the gains and, for the future, particularly if one takes account of the rapid growth of production in India, the gross tonnages required from Occidental sources can scarcely be expected to increase.

World trade in iron and steel for each of the six leading exporting countries is summarized in the accompanying table according to continents or grand divisions. These grand divisions serve to distinguish similar economic groups, but they do so only in a very general way, for the earth cannot now be divided off into quite such broad areas without including localities having unequal industrial development. Thus Europe must be split into two parts: The western section is essentially industrial, while the eastern section is even more essentially agricultural. Even in Western Europe, steel, while it has a dominant part in the economic life of Belgium, plays but a minor rôle in the adjoining Netherlands and in Denmark, only a little farther away, it takes almost no part at all.

United States in Europe on Sufferance

Normally, all Europe is closed to American steel exports other than a few specialties and such exceptional items as can be produced more cheaply in the United States than abroad. Great Britain, though everywhere our chief competitor, is our best European customer; in this case, American products supplement those of European origin. Italy has made large purchases in the United States from time to time, but ordinarily she is in the market chiefly for scrap to feed her own rapidly growing local steel industry.

Outside of Russia (an uncertain quantity), there are in Europe some 300 million people whose steel requirements can be supplied most logically by European plants—just as American plants are most favorably situated for supplying Canada and a few other nearby places. Neutral markets, so-called, are found mostly among the billion persons in Russia, Japan, China, India and in Asia generally, and among the 75 millions in Latin America. Africa, though credited with a population of perhaps 140 millions, takes rank as a steel consumer chiefly by virtue of the consumption in the British possessions in the south and in the French colonies in the north. Similarly in Oceania, Australia's 9 millions are British and the developing Philippines can scarcely be called a neutral market.

Population vs. Steel Consumption

POPULATION, of course, is an index only of potentialities since, for the present at least, it bears no definite relation to steel consumption. The American people, for example, though comprising scarcely 7 per cent of the world's population, contrive to consume more than 50 per cent of the world's steel. Nevertheless, to forecast world trade, one must consider not only the volume of business between existing commercial nations but also the rate of development of new countries and the rate of industrialization of backward lands.

Industrialization advances through three successive stages. Following the early exchange of raw materials for manufactured goods comes the beginning of simple manufacturing. This leads in turn into the final stage, wherein the country works up most of its own raw materials and purchases more materials abroad, paying for them in manufactured goods.

While steel plays an important part in each of these stages of development, consumption has hitherto expanded fastest in newly opened territories. Since 1913, population has increased only 1 per cent in Europe, compared with 16 per cent in Australia, 19 per cent in North America and 22 per cent in South America.

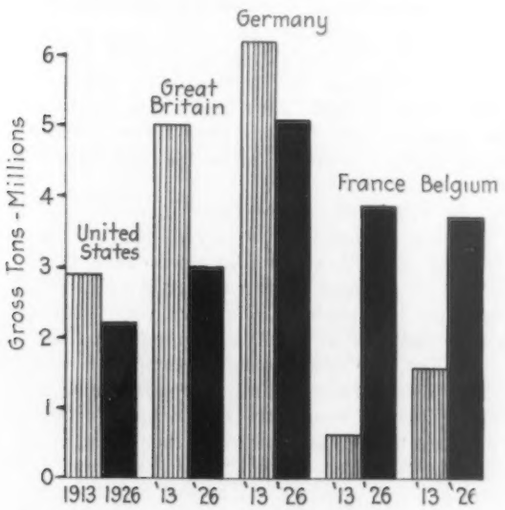
Industrial Development Faster Than Population Gains

More interest attaches, however, to the fact that new countries are developing rapidly—more rapidly than their growth in population indicates—and that economic activity is coming to be diffused more widely and more swiftly than ever before. It is also pertinent

IN previous articles in THE IRON AGE, *the present writer has reviewed the world's iron and steel trade from the standpoint of supply, analyzing, one by one, the productive facilities and international trade of each of the major foreign producing nations, and the relative costs of production. In another article of the present series, he took up the analysis of demand according to commodity groups, calling attention to the increasing importance in international trade of highly worked steel at the expense of pig iron and the cruder and bulkier forms of steel. The present article continues the analysis from the demand side, but takes it up geographically, according to consuming localities.*

to reflect that in new countries the first heavy demand for steel comes from the railroads. Next comes the call for wire and other fencing material, galvanized sheets for temporary shelters and cheap farm buildings. After a while, demand develops possibly for tin plate, first to make oil cans and later to supply canning industries.

At first this steel is likely all to come from abroad and, even from the start, the demand is enlarged because special industries must be served. As industrialization progresses, oil-well casing, mining drill steel, and more and more diversified products are required. A greater variety as well as a much greater quantity of steel must be furnished. It does not follow, however, that these growing needs will continue to be satisfied from abroad. The natural tendency, in fact, is for a local industry to develop and for this industry soon to furnish the bulk of the heavier kinds of products. This tendency has been demonstrated fairly recently in Australia, India, South Africa and



Great Britain's Export Movement of Iron and Steel Products in 1926 Was Strangled by the Coal Strike—But That of the United States Was Not. The growth in France and Belgium are significant, for both have gone far beyond the United States

elsewhere, and it is a factor seriously to be reckoned with in connection with future exports from Europe or the United States.

Tabular Showing of World Movements

The foregoing theoretical observations can now be projected by the reader (as he sees fit) upon the statistical basis provided by the table. This shows the exports of all kinds of iron and steel, exclusive of scrap, separately for each of the six leading producing countries. These six countries furnish fully 90 per cent of the total exports and the variety of their products is fully representative of the trade as a whole.

There is the usual criticism of these figures, that the data for one country are not strictly comparable with those for another. The German totals, for example, include a host of hardware and other finished articles (but no machinery), while those for France are restricted mainly to the ordinary run of crude iron and steel and rolling mill products. The official statistics of every country often contain errors and discrepancies; in cases where they fail to show the destination of certain products, I have been forced to allocate small tonnages to the areas to which it seemed logical they would have been shipped. It is my opinion, however, that, despite the minor errors which undoubtedly have resulted from these various causes, the tabulation does provide a reasonably accurate quantitative record of the changes which have taken place in the volume and direction of world trade since before the war.

Before passing to a description of conditions in the important consuming countries which make up the grand divisions, it may be noted that this table provides also a record of the shifts in trade of the individual exporting countries. France, for example, has actually secured the bulk of the increased business credited to Europe. Belgium's gain is roughly equivalent to Germany's loss—doubtless because Luxemburg has changed from one customs union to the other. The same observations apply generally also in Asia. But in Africa, Belgium and France seem both to have improved business with their respective colonies, while Great Britain has been less successful. In South America, Great Britain and Germany have lost heavily, France shows a relatively large percentage gain, though its trade is still very small, and the United States and Belgium (despite the inclusion of Luxemburg) have simply held their own. In Oceania, likewise, Great Britain is the chief loser and only Belgium shows even a small gain.

Increase in Europe

EUROPE, like the United States, is its own best market, accounting for 57 per cent of the total movement of steel in 1926 and 47 per cent in 1913. In fact much of this trade consists of exchanges between the producing countries themselves. These exchanges have increased but, contrary to a general belief, not because of changes in frontiers but because of England's larger purchases of semi-finished steel. On the Continent each country has been striving to become self-contained. Germany has duplicated, in the Ruhr, plants which were lost in Lorraine; while France is working up within her own borders much of the pig iron and crude steel which formerly would have been shipped from Lorraine to Westphalia.

New plants in Poland, Czechoslovakia and Italy have contributed toward a reduction in the exports of the leading European countries to their smaller neighbors. The collapse of Russian industry produced an even more depressing effect. Russia is committed to a program of self-sufficiency which, regardless of the general state of industrial activity, is likely permanently to curtail imports of iron and steel. Now all orders are hedged about with restrictive conditions that greatly hamper trade.

The European market has been dominated by Germany, which is situated even more strategically than France for supplying most of this business. England, also, has enjoyed a good Continental trade. The United States ordinarily gets very little. American sales have been mainly to Great Britain and Italy, the latter country taking, in addition to scrap, a fair quantity of rough finished plates and tin plate.

Canadian Consumption Less

Canada, which takes more than one-third of all the iron and steel exported from the United States, is virtually an extension of the American market. Eighty to ninety per cent of its supply now comes from the United States. Great Britain, which is favored by slightly preferential tariff rates on certain items, is practically the only other source of supply, although recently France and Belgium have made some sales of cast iron pipe and rails. Canada accounts for one-fourth of our exports of galvanized sheets and an even larger fraction of our shapes, black sheets and bars. It is practically our only market for plates and the chief consumer of plain and galvanized wire and of several other products, including tin plate, bars and sheets. In almost every department of our export trade, Canada is well represented.

The Canadian iron and steel industry is divided between Nova Scotia and the Great Lakes region. The former seems remarkably well-situated—on the coast,

not far from the great deposits of ore in Newfoundland and within 15 or 20 miles of excellent fuel. While a small export trade has been built up (notably of pipes and tubes with Australia), production, instead of increasing rapidly as it has in the United States, has fallen off roughly one-third since 1913. During the same period, imports likewise have declined.

Latin America and the United States

The Latin American trade area is split in two by the equator. The northern or Caribbean section embraces Cuba, Mexico and a few minor consuming localities which, like Canada, are reached more easily from the United States than from Europe. The southern section contains all the leading commercial countries of South America. But several of these, even though they may be somewhat nearer to the United States, have been bound to Europe by better developed trade routes and cheaper freight rates.

In the Caribbean area Cuban trade, particularly, is dominated by the United States, which is favored among other things by a 20 per cent remission of duties. American supremacy has been challenged, however, by Belgium—and to a less extent by Luxemburg and Germany—in such items as bars, plates, shapes, wire nails and rails. Cuban purchases, though strongly influenced by the railroads, sugar mills and the building trades, are well diversified.

Mexico has one plant producing both pig iron and steel, but nevertheless depends mainly upon its imports. In Mexican purchases from the United States, pipe goods predominate. Consumption, both in Mexico and Cuba, while it has increased noticeably, is still small per capita. Central American countries and other parts of the Caribbean region require very little steel.

In the keen competition for South American trade before the war, Great Britain and Germany were both well ahead of the United States and Belgium. The war placed the United States far in the lead and we still retain a relatively firmer grip on this trade than we had in 1913. The analysis of the various changes which have brought about this situation brings out some interesting facts but, in the space of the present article, attention can be drawn only to the increased sales of American sheets, especially galvanized sheets, to Brazil and Argentina, and to the trade in pipe and wire goods. An occasional burst of building activity and buying by the railroads are other highlights of the situation.

Specific Countries in South America

Brazil is the foremost South American country, comprising nearly 50 per cent of the population and ranking first industrially. Various industries are being vigorously developed and the Government aims particularly to build a great iron and steel industry upon the basis of the large deposits of high-grade iron ore. As a guaranty of future development, Brazil contains the largest area of unused land in the world today outside of Russia, and its steel consumption, though small per capita, is already large in the aggregate and varied.

Business conditions have been generally good in recent years but, for the present, manufacturing is still a matter mostly of small shops and agriculture is the leading industry. American capital has not been largely employed in Brazil and, since most of the railroads and other undertakings have been financed in Europe, the tendency has been also to buy steel and other goods in Europe. As a result American sales to Brazil of all classes of goods have fallen short of our preponderating purchases of coffee and other foodstuffs and materials.

In the Argentine, on the other hand, we sell more than we buy. Except for a few specialties like quebracho and wool, Argentina produces very much the same kind of products as the United States, which, in consequence, has made a relatively poor showing in Argentine imports of steel as against England and Germany and, for some items, as compared with Belgium and even France. The railroads are mostly of French or British ownership and Belgium's favorable credit policy has greatly advanced her sales of structural steel. However, Argentina is the second largest country in South America, with over 9 million people, 40 per cent of whom live in towns. So, despite all handicaps to American trade, it is rated as a good market for American steel, especially for plates and

EXPORTS OF LEADING COUNTRIES BY GRAND DIVISIONS, 1913-1926
(Calculated Into Thousands of Gross Tons From Official Trade Returns)

Exporting Country	Total	Europe	Asia	Oceania	Africa	Canada, Newfoundland, U. S. A.	Other North America	South America
1913								
United States (a)	2,907.6	395.7	238.6	201.1	36.8	1,430.7	225.0	379.7
Great Britain	4,969.2	1,308.2	1,429.0	822.9	444.5	363.8	30.0	570.8
Germany	6,202.5	4,454.8	769.7	123.9	159.2	111.7	17.0	566.2
France	619.9	492.2	14.5	0.7	85.8	1.0	2.4	23.3
Belgium (b)	1,550.9	915.4	246.5	42.6	82.9	....	....	263.5
Total	16,250.1	7,566.3	2,698.3	1,191.2	809.2	1,907.2	274.4	1,803.5
1920								
United States	4,708.5	1,070.7	1,411.0	150.1	74.2	692.9	407.8	901.8
Great Britain	3,251.2	1,164.5	1,116.7	300.0	316.8	113.5	9.1	230.6
Germany	1,723.3	1,536.4	76.2	29.5	9.8	0.6	....	70.8
France	869.9	790.1	4.4	0.8	61.6	2.0	0.3	10.7
Belgium (b)	925.7	774.7	58.9	3.9	36.2	0.0	4.9	47.1
Total	11,478.6	5,336.4	2,667.2	484.3	496.6	809.0	422.1	1,261.0
1925								
United States	1,680.0	60.7	220.8	104.2	30.3	614.7	260.0	389.3
Great Britain	3,731.5	835.5	1,074.5	637.8	477.7	286.0	10.0	410.0
Germany	3,211.8	2,076.3	344.5	88.6	118.1	154.2	9.8	420.3
France	3,860.3	3,564.5	98.4	0.5	118.1	26.8	2.8	49.2
Belgium	3,149.2	2,080.0	399.0	43.3	169.1	159.2	23.2	275.4
Total	15,632.8	8,617.0	2,137.2	874.4	913.3	1,240.9	305.8	1,544.2
1926								
United States	2,167.0	144.0	391.9	131.9	18.2	835.0	273.0	373.0
Great Britain	2,987.7	747.7	885.0	610.0	300.0	200.0	10.0	235.0
Germany	5,064.4	3,520.6	596.1	130.4	162.6	344.5	10.0	300.2
France	3,869.6	3,475.4	118.1	0.5	128.0	65.5	8.3	73.8
Belgium	3,716.0	2,328.9	619.7	62.1	186.1	214.9	24.4	279.9
Total	17,804.7	10,216.6	2,610.8	934.9	794.9	1,659.9	325.7	1,261.9
1913 to 1926:								
Increase, per cent...	9.6	35.0	...	...	...	...	18.7	...
Decrease, per cent...	...	...	3.2	21.5	1.8	13.0	...	30.0

(a) Fiscal year, ended June 30.
(b) Luxemburg included with Germany in 1913 and with Belgium in 1925 and 1926. Small exports from Luxemburg in 1920 not recorded.

sheets, casing and oil-line pipe and wire. Galvanized sheets have been a big item, partly because of Government purchases to be kept on hand for emergency use as barriers against locusts.

Chile Has Bounty on Steel

Chile, which is the center of American trade on the West Coast, has made great efforts to develop industrial activity among its 4 million people. Purchases by mining companies (mostly American), however, have proved the dominant factor in the import trade of Chile, as also in that of Peru and Bolivia. The railroads provide the next largest class of consumers and they appear now to be placing a larger fraction of their business in the United States. Building and canning practically complete the list of steel-consuming industries. To stimulate home production, Chile has provided a bounty of 15 gold pesos (about $1.82) per ton on pig iron and 20 gold pesos ($2.43) per ton on steel, which bounty may be doubled if the steel is exported.

Far East Imports Declining

OCEANIA and Asia can be combined loosely as the Far East. This may then be split into two divisions, depending upon whether or not the areas are part of the British Empire (or otherwise come within the special sphere of British trade). Local steel works form a disturbing factor in the group under British rule, and have even invaded neutral markets such as Japan and China. Australia, which took well over 500,000 tons of steel in 1913, has markedly reduced imports in most of the important classifications. Likewise in India, although imports still amount to 700,000 to 900,000 tons a year, the enormous increase in demand has been almost wholly offset by the greater output of local works, which have also built up a substantial export trade—partly at the expense of American and European exporters.

As is ordinarily the case, these new industries furnish principally crude or heavy products, but the Indian production of tin plate was 30,000 tons in 1925 and probably 35,000 tons in 1926, practically one-half the consumption. Due to the growth of the canning industry, Australia's requirements of tin plate have increased greatly. Galvanized sheet purchases also help to offset losses in other imports and Australia is taking more welded pipe, which it seems to be buying now mostly from the United Kingdom, Canada and the United States, instead of from Belgium, as formerly.

In India, Belgium runs a fair second to England as regards tonnage, although its products—bars, shapes, bolts and nuts, hoops and strips, nails, rivets, and heavy sheets and plates—have a much lower average unit value than British specialties. German shipments to India consist mainly of merchant bars, plates and black sheets, pipe and fittings, and hoops and strips. French business in bars and shapes is roughly equal in tonnage to American shipments of tin plate and galvanized sheets and a few other high-priced items.

As these same items are supplied mostly by the mother country, it is significant that the new tariff policy, effective April 1, 1927, substituting increased customs duties for bonuses fromerly extended to domestic manufacturers, also provides preferential rates for British imports. It will inevitably tend further to augment the relative advantage of British exporters in this market.

Japan, America's Chief Oriental Market

Almost one-half of all American exports to the Orient in late years have been destined for Japan. Chinese industry has been distracted by internal strife. In view of the political situation, foreign capital has been wary of new enterprises; Government construction has languished; railroad building has been at a standstill since 1913; and private electrical and hydraulic developments, as well as public service installations, have fallen far short of expectations. The Chinese iron and steel industry has not proved conspicuously successful and the newer works in Manchuria have looked to Japan for their market.

Chinese home demand is small and imports clearly reflect the slow progress of Western industrial ways among its large population. Cheap coolie labor makes China a good market for scrap—bar ends, wire shorts, tin plate waste, old files, and discarded material of sundry sorts—to be used not for remelting but for fashioning into tools and innumerable hand-made articles. The former Celestial Empire is likewise the chief consumer of bamboo steel, a cheap quality of high-carbon steel formed into corrugated bars which are heated and quenched to make them brittle enough to be broken readily.

Japan lost more wealth by the earthquake of September, 1923, than by a great military defeat; nevertheless it has managed to buy more and more steel. Consumption has now reached considerably more than a million tons annually. The ultimate plan is for the Government steel works at Yawata (said to be one of the finest plants in the world) to furnish the bulk of the demand for certain leading products. Lacking adequate ore supplies at home, Japan has been forced to import pig iron and semi-finished steel from India and China, but a determined attempt is being made to do most of the finishing and working up of the steel in Japanese plants. An almost prohibitively high tariff has already created a galvanizing industry, despite the fact that the black sheets must be imported and although wages (about 2½ yen, or $1.20 a day) are not particularly low and labor costs are disproportionately high.

Africa a Small Steel Consumer

American exports to Africa have always been very small, reaching a maximum of 74,000 tons in 1920. The Dark Continent consumes little steel anyway and it is mostly parceled out into colonies or mandates controlled by European nations. Since the chief consuming regions are British, it follows that Great Britain enjoys the lion's share of such trade as there is. The remainder goes principally to France which, in addition to supplying her own dependencies in North Africa, has lately been getting more trade in Egypt. Belgium also has a strong foothold in Egypt as well as in the Congo.

In common with other self-governing dominions of the British Empire, South Africa has in project a fairly large steel industry, which will produce at first chiefly sheets and wire. Since at present South Africa is making only a few thousand tons of steel a year, and hence depends mainly upon imports, the development of a large local steelworks will result in a sharp drop in outside purchases. Unless industrialization advances at a much faster pace than the present one, the development of a substantial local output would not be offset in Africa, as it was in India, by a corresponding increase in demand.

The Russian Soviet Government has entered into the manufacture of tin plate on a large scale at the works of the Masmaschtrust Serp & Molotto at Liswenski Sawod. The production is an effort to free Russia from dependence upon British mills for supplies. It is estimated that the Russian tin plate will cost at least $10 per box, compared with a British delivered price of about $5.60 per box.

The United Steel Works, Duesseldorf, Germany, and the Friedrich Krupp A. G., Essen, have purchased the exclusive rights in Central Europe for the production of a new low-cost stainless steel made under the Hamilton-Evens patents, owned by the Stainless Iron & Alloys Co., London.

Training in Foremanship Gains

Educational Courses for Foremen Show Marked Increase—Methods of Instruction and Their Relative Advantages Surveyed

BY JAMES A. MOYER*

FIGURES obtained by the Chamber of Commerce of the United States show that the number of foreman-training courses has increased several hundred per cent in a year's time. This is not a chance growth, nor has it come about because some organization or individual thought that it might be a good thing. In most cases the project was studied and planned just as thoroughly as any other phase of manufacturing. Furthermore, the tendency is to place the activity on a permanent and organized basis, continuous from year to year. Three hundred and twenty-four courses of the kind which were conducted on an organized basis have been reported for the year ended June, 1926.

The number of foremanship courses which were given in the States having an appreciable number of classes is given in Table I, in which separate columns indicate the number of classes given respectively by State university extension, State vocational or private agencies.

The State vocational course in foreman training is usually given by the board of vocational education, which has its headquarters in each State, as a rule, in the capitol building. State university extension courses are given by Iowa State College, Ames, Iowa; Massachusetts Department of Education, Boston, Mass.; Pennsylvania State College, State College, Pa.; Rutgers University, New Brunswick, N. J., and University of Wisconsin, Madison, Wis. State-supported courses are offered, of course, at nominal fees or on a basis of free instruction.

Need for Foreman Training

One of the most valuable and important assets which industry has today is the foreman. Foremanship training *prepares* individuals for discharging effectively the responsibilities of the foreman's job as supervisor and trainer, and aids individuals already employed as foremen to perform their duties more effectively. Another of the objects of such training is to make the foreman's responsibilities familiar to others whose work draws them into contact with foremanship problems, such as storekeepers, timekeepers, tool department heads, schedulers, dispatchers and others of the non-productive or service staffs, including members of the higher supervisory staff coming between the foremen and the general management, such as production and planning department men, cost department men, assistant superintendents and superintendents.

The foreman of today must be a leader and a potential executive instead of merely a driver, and he must get the proper idea of what an executive is. Diemer summarizes foreman training by saying that the foreman must be taught (1) *how to get results by the use of his men and materials,* (2) *how to plan,* (3) *how to use his head instead of his muscle and,* (4) *how to get his men to work willingly and enthusiastically.*

The foreman is the most important factor in developing and keeping loyalty in an organization. The right kind of foreman is a builder of men as well as a developer of output.

A careful analysis of a number of successful foreman-training courses shows that the work depends upon a number of factors, such as the following: (1) the attitude of the management; (2) the character of the group; (3) the subject matter of the course; (4) the ability of the instructor, or leader or chairman; (5) the type of instruction; (6) the conditions under which the training is given.

Management's Part in Foreman Training

Foreman training must be initiated, supported and followed up by the management. No undertaking of this kind can be carried out successfully in an atmosphere of uncertainty, doubt, suspicion and unwillingness. The very nature of the class or group meetings demands an open discussion of actual plant problems which may involve the company policies.

It is important that the practical foreman get a real view and an adequate understanding of what the management has in mind in promoting foreman training. Loyalty is based upon understanding. The foreman comes directly in contact with men. Where the contact exists, one finds the origin of harmony or discord.

One method of determining the possible interest in foreman training in a particular industry is to call a voluntary meeting of foremen for the purpose of explaining the plan of training, with an individual follow-up afterward. If possible, each man should receive a comprehensive private outline of the subject matter or topics which are to be considered, in order to give him some idea of the scope of the work. He should understand also that such an outline is merely tentative and is flexible enough so that it may be changed to suit the requirements of his group. When the instruction is given by the lecture-and-discussion method a careful explanation of the procedure is necessary in order that the men may understand the part which they will play in the development of the course.

Men in Class Should Be of About the Same Rank

One of the most important factors in the success of a foreman-training project is that those in the group should be men who have approximately equal rank. The main reason for this is to insure full and free discussion. It is seldom that this kind of discussion is obtained when an executive of higher rank attends the meetings. Likewise assistant foremen and prospective foremen seldom feel free enough at a meeting of this kind to utilize the advantage and purpose of the work to the utmost. General experience indicates that the training work should be carried on at one level in order that the personnel of the group may be homogeneous. The management may keep fully informed of the progress of the work without being present at the meetings. But the instructor or group leader must not put himself in the position of being a tattletale. One very good way of dealing with this matter is to have meetings with the superintendents and other executives in parallel with the classes for foremen.

In addition to training in production policies and methods of leadership, foremen should be taught elementary management principles. Where the foremen have been educated to an understanding of the principles of management, there is an appreciation and intelligent discussion of proposals which, without such

*State director of University Extension, Massachusetts Department of Education. Abstract of paper presented at the national meeting of the American Society of Mechanical Engineers, Machine Shop Practice Division, New Haven, Conn., Sept. 8.

training, would have been misunderstood and probably opposed, or not carried out correctly.

Topics for Study and Discussion

Valuable results of a tangible character have consistently been secured through the use of all sorts of courses under varying conditions. It is absurd to insist that there is a standard procedure for instruction. The best teacher is the one who is resourceful enough to utilize any combination of methods that will secure the desired result.

Any text material which is used for home study should serve to acquaint the individual with the general principles which apply to the duties of foremen, and tend to stimulate interest in thoughtful discussions. The application of these general principles to the particular problems of foremen are, of course, brought out during the class of group discussions. It has been found that a foreman can seldom contribute much to a conference unless he is familiar with the fundamentals underlying present-day industrial organization, production planning, personnel control and costs. If the text material presents these subjects concisely, clearly and simply in language which is easily understood, it is of inestimable value in providing the necessary educational background. A foundation knowledge of this kind, reinforced by problems, conferences and discussions, forms the most satisfactory basis for operation. The use of ordinary academic text books on management is seldom satisfactory for foreman-training classes or groups. It should be understood that any references which have been made to text material applies to that which has been prepared especially for the use of foremen.

Methods of Instruction

It has been said that the aim of instruction as used in foreman training is to stimulate thought, discussion and action. The conference and discussion method as compared with the straight lecture is far more stimulating, because it encourages active thinking on the part of the individual.

The usual production conference for foremen does not cover all of the purposes aimed at in foreman training. In general, the production conference is a meeting at which subordinates receive directions from their superiors for the performance of their work. It is not essentially a method of training, although it may have some educational value.

So far as possible, the topics of discussion should be arranged and grouped so that there is a logical progression of thought throughout the course. Furthermore, the instructor or group leader, in developing the discussion at a class or group meeting, should aim to give emphasis and significance to *one particular idea*. This may be approached from several viewpoints in order that it may connect with the self interest of each member of the group.

Some topics for discussion which can be handled with profit are job analysis, plant organization relationships, interest in the job, keeping up production, lowering costs, laying out work, distribution of supervision, carelessness on the job, leadership, making reports, records, apprentice training, cooperation. It is obvious that the discussion method of instruction could not be used with such topics as wage policy, selling. costs and marketing; not at least until a considerable amount of direct information had been given to the group by some executive of the company. Again, the handling of such topics as the administration of first aid and the training of workers involves ability to perform, and requires preliminary instruction before any discussion is of value.

TABLE I

Foreman-Training Courses, June, 1925, to June, 1926

	Agency Giving Courses		
	State University Extension	State Vocational Education	Private
Indiana	..	33	3
Ohio	..	31	5
Iowa	33*	..	1
Massachusetts	8**	1	18
New Yerk	..	..	27
Pennsylvania	9	1	4
Colorado	..	12	1
Virginia	..	10	3
Illinois	..	4	8
Arizona	..	10	..
New Jersey	5	..	5
Wisconsin	8	..	1
Georgia	..	8	..
Missouri	..	3	3
Tennessee	..	5	1
Louisiana	..	4	1
Michigan	..	..	5
California	..	..	5

*In Iowa foreman-training courses are given in a number of classes by Iowa State College in cooperation with State Board for Vocational Education.

**Foreman-training courses are also given for *correspondence instruction* by State University Extension, Boston, Mass. Residents of any State are eligible for enrollment.

Good Instructor Important

It is no easy matter to secure a satisfactory instructor, leader or chairman for class meetings or group conferences of foremen. The instructor has before him a difficult job of teaching. His success depends largely upon the degree to which he can function as a teacher without using ordinary class or lectural procedure.

Foremanship instruction may be made available through the State Department of Vocational Education, just as instruction is available in the vocations which may be authorized by State laws. All of the States and the Territory of Hawaii take advantage of the distribution of Federal funds under the Smith-Hughes Act, where, for every dollar spent (by the Federal Government) the State, local community, or both, will expend an equal amount.

Assistance in carrying on a foreman-training activity may usually be obtained from such institutions as State university extension, State vocational education, local manufacturers' associations, State manufacturers' associations, trade associations and private agencies.

The manufacturing department of the Chamber of Commerce of the United States has published in its bulletin entitled "Foremanship," a precise, yet comprehensive, statement of the several plans by which foreman training may be organized. This information is summarized in Table II.

Where and How Often Conferences Should Be Held

A suitable place in which foremanship class or group meetings may be held is necessary. The type of room may vary from an executive's office to a corner of the factory. The only requirements are enough space, suitable light, heat, ventilation and chairs. A fairly large blackboard is needed as well as some arrangement to allow the men to take notes. A group usually consists of from ten to twenty-five members. The degree to which informality is present, together with the absence of artificial restraint, will have much to do with the response from the members of the group.

The amount of time which is taken for discussion conferences varies considerably. In some large industries the work is done intensively and the men may be brought from branch factories to a central location for a two weeks' conference with all-day sessions. It is more common, however, to have class or group meetings for about an hour once a week. When the meetings are held monthly they last for 3 hr. or more.

The time of meeting likewise offers a number of variations. The meetings may be held on company time, or on the men's time, or upon some combination plan. As a rule it is found that local conditions enter largely into making the decisions in such cases.

It is apparent from the experience of industries which have undertaken foreman-training courses that many of the advantages derived come from the discussion of current plant problems. It seems to follow logically, therefore, since such problems are always present, that a continuous program of discussion conferences is desirable. If the original schedule is intensive, and the follow-up work was begun on a weekly or monthly basis, there is no reason why it cannot be continued in this way, except perhaps during the summer.

Beneficial Effects of Foreman Training

The cost of foreman training will vary, depending upon the plan of operation. It is difficult to measure

TABLE II

SUGGESTED PLAN 1

Foremen's club.
Advantages such as
1. In many cases there is already such an organization.
2. Easy to organize if there is none.
3. Promotion of mutual acquaintance.
4. Sociability.

Disadvantages such as
1. Primarily interested in technical questions.
2. Tendency to have set programs, papers, etc., rather than discussion.
3. Organization may be too large for conference discussion.
4. No one specifically responsible for maintaining conference program.
5. Probably handled by discontinuous discussion of unrelated topics.

Success factors (samples)—
1. Intelligent leadership.
2. Degree to which free discussions of phases of the foreman's job can be realized.
3. Interest of the foremen in the club.

SUGGESTED PLAN 2

Plant program carried on by a member of the organization.
Advantages such as
1. Conference leader has been through the first series and has some knowledge of how a conference should work out.
2. Conference leader from organization will know company policies and organization.
3. Conference leader partly trained as by-product of first series.

Disadvantages such as
1. Conference leader has attended the first series as a participant and will not have the detailed "operating information."
2. Man from organization will have inside information and may have difficulty in securing impartial discussion of plant cases.
3. Not necessarily any tie-up with public educational system.
4. Conference leader may run out of ideas if there is no follow-up for him (as conference leader).

Success factors (samples)—
1. Degree to which conference leader had the confidence of the foremen.
2. Ability of conference leader to grasp the principles worked out in the first series and apply them himself.
3. Ability of conference leader to discuss problems with the foreman on a man-to-man basis.

SUGGESTED PLAN 3

Several plants cooperating and exchanging conference leader.
Advantages such as
1. Each plant secures impartial discussion of conference topics.
2. Outside conference leader may bring new ideas and a new viewpoint.
3. Favorable set-up for maintaining interest.

Disadvantages such as
1. Conference leader may not know enough about a given plant (organization, policies, etc.).
2. Men may not feel free to discuss plant problems with an outsider.
3. Gossip might be peddled from plant to plant by an unwise conference leader and cause trouble.

Success factors (samples)—
1. Adaptability of conference leader.
2. Cooperation between plants.
3. Cooperation between conference leaders.
4. All parties concerned being on the level.

SUGGESTED PLAN 4

Have the service of an educational engineer made available for a number of plants. (Educational director employed by Chamber of Commerce, manufacturers' association or similar organization.)
Advantages such as
1. All plants participating have expert service by a specialist.
2. Plants may develop leaders in their own organization and extend their educational program as a plant activity.
3. Cost for each plant would be less under this plan for equally expert service.
4. Impartial discussion by outside expert.

Disadvantages such as
1. Few highly qualified men available.
2. A bungler on this job would do irreparable damage.
3. Possibility of increased suspicion on the part of foremen.
4. Educational program may not be tied up with public program for vocational education.

Success factors (samples)—
1. A thoroughly well qualified educational director.
2. Cooperation on the part of participating plant and central organization.
3. Degree to which educational director is able to secure confidence of all parties concerned.

SUGGESTED PLAN 5

An individual plant to hire its own educational director.
Advantages such as
1. Expert service by man tied up with the organization.
2. A well balanced plant program.

Disadvantages such as
1. High cost of such service.
2. Scarcity of qualified men.
3. Outsider coming into organization may arouse antagonism.
4. Educational program may not be tied up with public school program.

Success factors (samples)—
1. Highly qualified educational director.
2. Degree to which educational director secures the confidence of men and management.

SUGGESTED PLAN 6

Public school to furnish expert service to plant. (This is a real job for coordinator of part-time trade extension work.)
Advantages such as
1. Close correlation between plant program and public school program.
2. Expert service available without direct expense to the plant.
3. Possibility of discussing all questions in a strictly impartial manner.

Disadvantages such as
1. Possibility of having a poorly qualified man on the job, due to low pay.
2. Common attitude of foremen toward teachers.

Success factors (samples)—
1. Qualifications of the conference leader.
2. Ability of conference leader to sell his ideas to industry.
3. Cooperation between schools and industry.
4. Attitude of the city superintendent and board of education toward this type of activity.

the return on the investment. The experience of many industries has shown as a result a noticable improvement in morale, production, costs, and labor turnover. If this improvement represents even a small percentage in each factor, the total savings are far greater than the expense.

The rapid growth and permanent status of foreman training is due to the fact that it is one solution to the problem of increasing the morale of men as individuals and as members of a manufacturing organization. It makes possible a method which gives the foreman a definite point of view regarding company policies, produces a better understanding of responsibilities, increases both vertical and horizontal cooperation, and stimulates thought and discussion along lines not covered in everyday practice.

Machinery Displacing Men Faster Than New Industries Can Absorb Them

WASHINGTON, Oct. 10.—Pictured as a startling feature of present-day American Industry, Secretary of Labor James J. Davis in the September number of *Monthly Labor Review* discusses problems arising from labor-saving machinery. He urges a new type of "invention" so that use can be made of men thrown out of employment by such machinery, whose great value he fully realizes.

"In the long run new types of industries have always absorbed the workers displaced by machinery," says Mr. Davis. "But of late we have been developing new machinery at a faster rate than we have been developing new industries. Inventive genius needs to turn itself in this direction.

"As I look into the future, far beyond this occasional distress of the present, I see a world made better by the very machines invented today. I see the machine becoming the real slave of the man that it was meant to be. I see it lengthening the useful lives of men. Today we are scrapping men at the age of 45 or 50 because we think their skill is slipping. Tomorrow the machine will supply the skill, and a man of 70 may operate it as well as one of 20.

"Machinery has built our enormous cities of today. Tomorrow will see the highways broadened for better traffic, and the air thickened with new methods of transportation. When that has come, this intense centralization of industry will be unnecessary. The worker and the farmer will live side by side, to the advantage and better understanding of both. Machinery will do the work, and men will have time to live. As they have time to live, they will cultivate more and more the things worth living for. We are going to be masters of a far different and better life."

Method of Handling Sheet Steel

Problems of Transporting Troublesome, Awkward Form of Metal Are Solved by Simple, Economical Plan

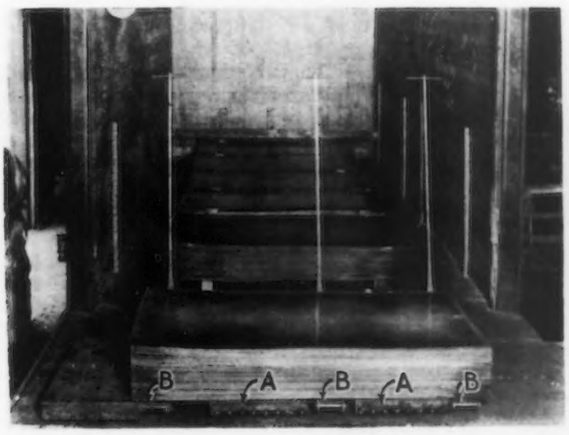
LOADING and unloading sheet steel are tasks which have been given over as a matter of course to "main strength and endurance." Packing sheets for shipment involved concentrating it and bracing it with a framework of heavy lumber, held in place by stout spikes driven into the sides and floor of the car.

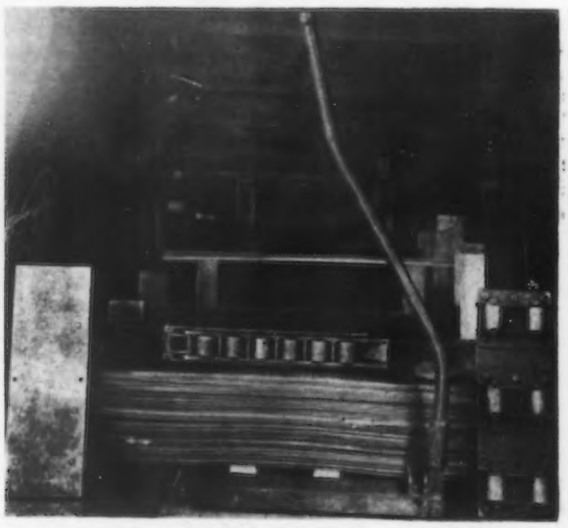
Into this phase of railroad freight transport the Ford Motor Co. has brought, in the first instance, a large measure of mechanical assistance and, in the second, a method by which the load is spread over the area of the car in such a way that its own weight helps retain it securely in place.*

*This article is taken from "Ford News."

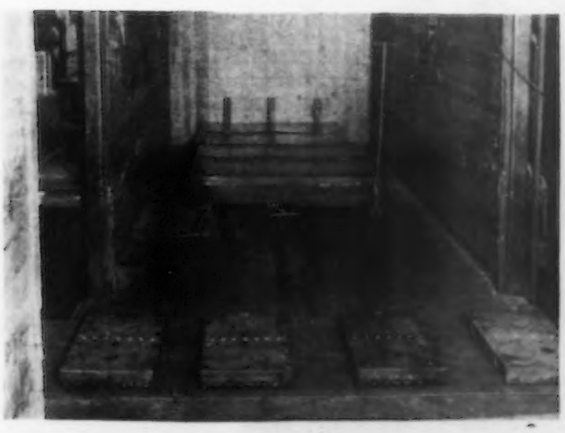
The old method of loading and unloading sheet steel consisted simply in carrying it, two or three sheets at a time, into or out of the car. The size, weight and flexibility of the material required two men to handle sheets. Further, the handling was arduous and hazardous work. Four men required 4 hr. to unload a 50-ton car. Despite the best of care, the old method invariably caused a considerable amount of scratched and otherwise damaged material.

Under the present method, the steel is handled entirely mechanically, and by power machinery as far as the car door and away from it. The job is no longer a test of strength and endurance, and contains a certain latitude for the development of deftness and





Load of Steel Sheets (Above) Brought into the Car on Dollies A A and About to Be Lifted on Lift-Dollies B B B for Transfer to Its Resting Place (Below) Where It Is Deposited on the Wooden Sleepers. At upper right are details of the dollies and at lower right the load being swung into the car door by crane



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On the dollies the steel is moved into the car. Then it is transferred to lift dollies, which by means of a long handle may be elevated from 3 to 5 in. with a single motion. In the remainder of their structure the lift trucks resemble the transfer dollies. With a lift dollie, one man easily can raise from 3 to 5 tons. These are put beneath the loads, the handles are thrust down, and the steel is lifted from the transfer dollies and moved over strips of steel—an excellent trackway—to its position in the car.

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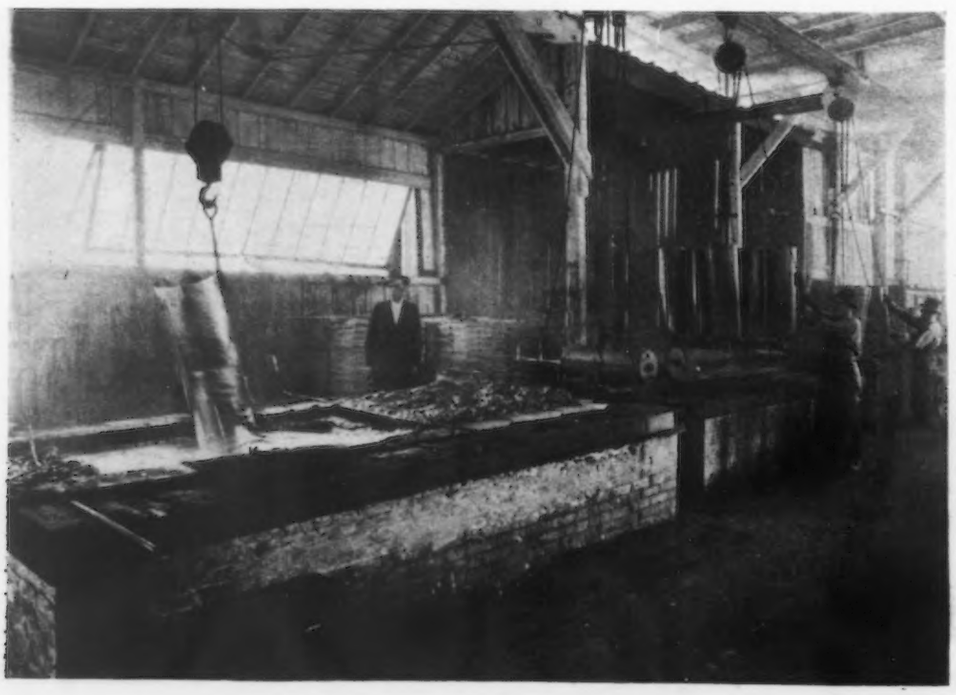
PICKLING hot-water heater boilers in a vertical position is one of the practices of the Day & Night Water Heater Co., Monrovia, Cal. The vats are 6 ft. deep and the boilers are submerged vertically on bronze racks, each of which holds 12 boilers. It is believed that by this means the material to be galvanized is cleansed more perfectly than would be probable by the customary method.

Much miscellaneous material, besides the boilers, is handled on these bronze racks. The racks are lifted



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and otherwise handled by means of an electric hoist running on an I-beam suspended monorail, as shown in the illustration. This method of handling saves considerable time and labor, as compared with the hand method common in small plants.

After pickling, the boilers are removed from the racks and dried on an open-top dryer heated by the waste gases from the galvanizing pot. They are laid on the dryer in a position to drain. After drying they are lowered through the flux by means of an ordinary rope tackle. To insure a perfect coating on the interior, the boilers are completely filled and submerged in the zinc, after which they are pulled out by means of the electric hoist. The galvanizing pot is 10 ft. long, 3 ft. 6 in. wide and holds about 18 tons of zinc.

The photograph shows chain hoists in use over the pickling tank, this being the custom when the electric hoist is in use elsewhere. The open construction of the plant, shown in the illustration, facilitates ventilation and, as it is located within 18 miles of Los Angeles, it is not subject to the seasonal cold weather experienced in most such plants in the East.

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It is reported that this fast melting did not injure the pot or the setting. Insulating brick was used to line both combustion chambers and flue so as to effect the greatest possible economy in the use of gas. Naturally, every detail of the change had been worked out carefully in advance and every item of material and equipment needed was on hand and ready for use. Under these conditions the cost of the change was less than for previous changes of the same sort in that plant.

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Pulverized fuel equipment to be used involves a bunker arrangement, conveyor for bunker fuel, pulverizer, distribution of pulverized fuel to each furnace and burner equipment. Both the bunker arrangement and the conveyor system are designed to reduce to a minimum the man-handling of coal. This will result in reducing both the operating wage and the subsistence cost.

The proposed arrangement is to install a daily supply bunker above each pulverizer, into which will be fed a fuel supply for 24 hr. This coal will be carried up from the main bunkers by endless chain conveyor and discharged into a crusher. Large lumps of run-of-mine coal will be broken to a maximum of 1½ in., and the crusher discharges by gravity into the daily bunker. This in turn discharges by gravity into the feeder for the pulverizer mill. Crusher and conveyor are designed for filling the daily bunker in about 2 hr., leaving the remainder of the time for the coal passers to trim fuel from coal pockets to the conveyor feed hopper.

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Discuss Alloy Irons at Glasgow

Two Important Papers on Blast Furnace Practice Also Figure in Program—Effect of Low Ash in Coke—New Theory of the Cast Irons

(Special Correspondence)

At the first session of the Iron and Steel Institute at Glasgow, Scotland, Sept. 20, the first paper presented was that by Theodore W. Robinson, vice-president Illinois Steel Co., Chicago, on "The Economic and Social Development of the American Steel Industry." An abstract of this paper was published in THE IRON AGE, *Sept. 22, pages 785 to 787, and some of the discussions in last week's issue, pages 947 to 949. In the following columns are reviewed some of the technical papers and discussions.*

GLASGOW, SCOTLAND, Sept. 21.—Four papers, presented at the first day's session, are abstracted with part of the discussions, as follows:

Effect of Nickel on Cast Iron

The International Nickel Co. of Canada, Ltd., has provided a research fellowship at Birmingham University for an investigation into the effect of nickel as an alloying element in cast iron, and a report on the work accomplished was presented by Dr. A. B. Everest, T. H. Turner and Dr. D. Hanson. Nickel ranging between 0 and 40 per cent and silicon between 0 and 3.6 per cent were investigated. Nickel was added to the iron in the crucible as nickel-silicon shot. The method was effective and the loss of nickel was negligible.

The original iron-carbon alloy was white and unsound. Small additions of nickel rendered this iron first sound, then gray. It was established, however, that, although the action of small amounts of nickel was similar to that of silicon, nevertheless the production of a given degree of graphitization required about four times as much nickel as silicon. Nickel, therefore, reduced the tendency of the iron to chill. Nickel and silicon, separately or together, tended to graphitize about 50 to 60 per cent of the carbon in 1 in. thick sand castings of this alloy.

Effect on the Graphite

The graphite produced by the action of the nickel was, in general, finer than that produced by silicon. Nickel additions to a silicon-iron tended to refine the graphite. The addition of nickel also tended to produce a finer pearlite or to render it sorbitic. Above 5 per cent nickel, the alloys became hard and unmachinable, due to the formation of martensite. This condition persisted up to about 18 per cent of nickel when the alloys became austenitic, soft and non-magnetic, the latter property being most marked at 20 per cent of nickel and 1.3 per cent of silicon. Beyond 20 per cent of nickel the alloys remained soft, but they became increasingly magnetic again.

Hardness curves showed softening during graphitization, hardening through the sorbite and martensite ranges, and finally softening to the austenitic condition. The densities were high for gray irons, but all lay between the limits normally given for white and gray irons.

Annealing at the proper temperatures rendered most of the unmachinable alloys machinable through the tempering of the martensite. The nickel-silicon irons were unstable on heating, but not so much as the ordinary silicon irons. In high-nickel alloys graphite was precipitated from the austenite, which tended to become martensitic, but remained machinable.

Tests on the resistance of the alloys to corrosion in sulphuric acid showed that, with small additions of nickel, the alloys were more rapidly corroded than on ordinary cast iron. High additions of nickel, however, rendered the alloys austenitic, and great resistance to corrosion was shown.

Dr. Cecil Desch said that he had visited the laboratories of the International Nickel Co. in New Jersey during the early part of this year and found that work was proceeding on the effect of nickel on cast iron, but it had not gone as far as that described in the paper. He thought the authors' work would be particularly interesting when they dealt, in future, with the more complex system of nickel-chromium-cast iron, which seemed to him to be one of the most promising materials for use at present.

American and British Practice Compared

T. Henry Turner, one of the authors, said that in his opinion the research appeared to be necessary. By an examination on the spot he had satisfied himself that nickel was actually being added to the commercial cast iron in ordinary every day routine works practice in many of the best North American foundries, and that was in relatively small quantities of high grade cast iron. So far as he was aware a similar practice did not exist in Europe, and the published data were so contradictory that they could not be regarded as wholly reliable. He looked round to see why that difference should exist. He noted that the Americans were using a low total carbon by diluting their cast iron with steel scrap, that the northern irons had a low phosphorus content, but when nickel was added it reduced the ordinary silicon content. In all the works that he visited nickel was being added in the form of a low melting point alloy.

So far as he could see their results confirmed those obtained in the American works in so far as the combined influence of nickel and silicon were concerned, and also confirmed the result that nickel could be added to cast iron successfully in the form of a low melting point alloy, nickel-silicon shot. The latter point was worth emphasizing because during the time the experiments had been carried out at Birmingham another European worker had endeavored to add nickel to cast iron in the form of pure nickel shot placed at the bottom of the ladle, but with unsuccessful results. The difference between the success achieved at Birmingham and the failure of that European worker might be the explanation of the varying results obtained in the experiments recorded in the literature referred to in the paper.

Effect of Chromium with Nickel

It was hoped in the near future that further experiments would show the influence of phosphorus, chromium and total carbon variations in conjunction with similar additions of nickel. Those results would be awaited with great interest, because in the meantime some published results showed that small test pieces of cast iron could be made with a tensile strength of 47 tons per sq. in. containing approximately 3.50 per cent nickel and 0.50 per cent of chromium. It was in

that direction, with nickel and chromium ratios approximating those found in nickel steels, that one would expect success to be achieved so far as improved mechanical properties were considered. Aero engines, steam engines, Diesel engines, automobile engines, electrical resistance grids and many other special types of cast iron might not form a very large tonnage compared with cast iron pipe, but they were essential in many directions of modern engineering development, and it was in regard to that sort of cast iron that he hoped the paper would prove of ultimate, if not of immediate, value.

Nickel Added as Nickel-Silicon Alloy

Prof. D. Hanson said that reference had been made to the addition of nickel in the form of nickel-silicon alloy to cast iron, that being the way in which it was added in the work that Doctor Everest had carried out. He desired to make it quite clear that it was not suggested that that was the only way in which nickel could be added to cast iron. It was being added successfully in that way, but it was also being added quite successfully in the form of pure nickel shot to the ladle and small ingots of pure nickel through the cupola. Some people had trouble when they added nickel, but if the metal was hot enough it could be done quite successfully in that way, as it was being done not only in America but in Great Britain.

Other Ways to Add Nickel

W. T. Griffith corroborated Professor Hanson's statement that pure nickel could be added to cast iron in other forms than the shot referred to in the paper. That was actually being done in America and in this country. Apart from that point he desired to give two warnings especially to users of nickel as an addition to cast iron in this country. The first warning was that, having heard of the successful addition of nickel to cast iron in other countries than our own, people must not expect that it was an easy proposition to immediately get good results by adding nickel to any cast iron.

There were certain very definite differences between the irons used across the Atlantic and those in common use in this country. A considerable amount of research might be necessary before it would be possible to define the best conditions under which nickel might be added to cast iron. The second warning was that having added nickel to cast iron in this country, if success was not immediately obtained he suggested the conclusion should not at once be arrived at that the addition of nickel to cast iron was of no use.

A New Theory of the Cast Irons

IN a paper, "Constitution of Silicon-Carbon-Iron Alloys and a New Theory of the Cast Irons," Dr. D. Hanson described an investigation carried out on ternary alloys of iron containing 0 to 2 per cent silicon and 0 to 4 per cent of carbon. Three diagrams, each representing the constitution of alloys containing a silicon content, have been constructed. It is shown that, in the ternary alloys, graphite and cementite can occur as stable phases, either separately or together, and the limits of temperature and composition within which each occurs have been determined.

Dr. W. H. Hatfield welcomed the fact that the authors had reawakened an interest in the iron-carbon diagram. That certainly was necessary because they did not possess at the present time sufficient experimental data even to attempt to draw a final diagram. A little time ago he was interested in looking for the most reliable iron-carbide diagram he could find. He turned up the new international tables and was there referred to the iron-carbide diagram produced by a distinguished member of the Institute. He found that the whole of the region with which the author dealt included the carbide phase. He did not believe that that could be true, but the difficulty was great because experimentally it could not be said it was not true.

A decision could not be given because a perfectly pure iron-carbon series covering the whole range had not been done and adequately experimented upon. It was therefore very satisfactory that the author had commenced to work on the subject.

American and German Nomenclature

The author used the term graphitization in regard to white iron which was heat treated. Surely that was misleading. It was the importation of American nomenclature instead of the utilization of the more correct German nomenclature, which spoke of such carbon as tempered carbon. Tempered carbon occurred in a nodular form as distinct from the graphite, so characteristic of the graphitic condition.

Lastly the author spoke of the old European process as being simply one of decarburization. It was not. It was a case of precipitation just as in the American process, the only difference being that the presence of a higher sulphur content prevented the carbide which separated at the eutectic point from dissociating. If a large number of samples were studied it would be found that in a properly decarbonized European white iron there was a graphitic content which might be as high as 2 per cent.

J. H. Whiteley said he was inclined to agree with the author in his very interesting paper. It had always seemed to him for many years that it was possible to have both graphite and cementite stable in iron under certain conditions, and the author's view that it was possible to have two systems which interlocked at certain points was a feasible one.

Iron-Carbide Is Stable

M. L. Becker thought the paper contained a reasoned hypothesis concerning the constitution of the iron-carbon-silicon alloys over a range of composition which was particularly interesting from the practical point of view. The most important suggestion, and the one upon which the whole scheme seemed to depend, was that in which the author suggested that iron-carbide was stable and not graphite below a certain temperature. Any attempt to explain the anomalies which had been so frequently noted in connection with the cooling and graphitization of cast iron was extremely useful at the present time. There were plenty of anomalies which were not yet understood, and for the moment he felt a little bit critical about the question of the stability of graphite.

The Author Replies

Professor Hanson, in reply, said he did not approve of the attitude which Doctor Hatfield had taken, that the only alloys that could be stable in an investigation of that nature were the alloys with which he was accustomed to deal commercially. Doctor Hatfield quarrelled with the alloys that he had taken for the work and said that they were not suitable. If those alloys had not been there it would have been quite impossible to investigate the very important region in which both graphite and carbon were unstable. It was simply by taking alloys that were not used commercially that it was possible to throw a little light upon the important range between the two.

Ash in Coke for Blast Furnace Working

IN a paper of the above title, C. S. Gill, Consett Iron Co., Ltd., gave the results of some practical tests made by him at Consett in order to define those attributes of blast furnace coke which give the most satisfactory results in practice. In one of the tests where all the furnaces were changed over from coke with 12-15 per cent of ash to coke with 9.76 per cent of ash, an improvement in coke consumption of 1.01 hundredweight per ton of pig was the result, and an increased make of 15.4 per cent was achieved. In the second test where one furnace was changed from coke with 12.5 per cent of ash to coke with 8.75 per cent of ash, there was a saving of 0.47 hundredweight of coke and an increase of 6.7 per cent in make per 1 per cent reduction in ash.

Low-Ash Coke Preferred

These figures provide a basis upon which the whole question of the provision of low-ash coke for blast furnace use may be worked out from a financial standpoint. Thus, in a case where two cokes were available, containing 12 per cent and 9 per cent of ash respec-

tively, the reduction in coke consumption by the use of the latter would be $0.42 \times 3 = 1.26$ hundredweight per ton of pig. This, based on coke at 20 shillings per ton at the furnaces, is equivalent to a direct saving of 1s. 3d. per ton of pig made. There is also material saving due to increased output, more regular product, etc.

Theory of the Blast Furnace Process

Dr. Fritz Wüst, Dusseldorf, Germany, pointed out, in a paper on the above subject, that oxidation of the iron occurs in the oxidizing gas phase in front of the tuyeres, whereby the slag becomes charged with ferrous oxide. Therefore no reduction of manganous oxide, silica, and phosphoric acid from the slag can take place, for the reason that silicon, phosphorus, and manganese would immediately become re-oxidized by the iron oxide. The reduction of these oxides must therefore be effected above the tuyere level. Analyses of washed iron from five charcoal blast furnaces and one coke blast furnace prove this.

Tests with silica, phosphoric acid, and manganous oxide resulted in the reduction of these oxides with elementary carbon in the presence of iron. Silicon, manganese, and phosphorus diffuse into the iron before melting in the same way as carbon, so that the iron is actually formed into pig iron before it melts. Hydrogen and carbon monoxide reduce only manganous oxide. For the reduction in the blast furnace, the principal agent is the carbon formed according to the equation $2\ CO = CO_2 + C$, which penetrates into the pores of the ore, thus specially tending to promote reduction.

The papers by Mr. Gill and Doctor Wüst were discussed jointly.

Prof. Henry Louis said he desired to confine his attention to Mr. Gill's paper, because it was one of very great interest at the present time when it was necessary for everybody to strive to introduce every possible economy and to keep down costs. The author stated that there was a direct saving, by the use of coke containing 3 per cent less ash, of 1s. 3d. per ton.

Cleaning of Coal Essential

Less ash in the coke under modern coal mining conditions could be obtained in one way only: Cleaning the coal. Apparently therefore the saving which the author referred to must be obtained by coal cleaning methods. Technically coal cleaning had, within the last decade at any rate, improved so greatly in this country that it was in a fairly strong position. There were many coal cleaning plants in use in which it was possible to clean the coal down within 1 per cent of the theoretical, i.e., the results shown by a coal washability curve. So that the technical question might be said to be pretty thoroughly solved.

The outstanding problems were of an economic character. He had the pleasure to be present at the coal cleaning conference held two months ago over which Doctor Lander presided at which it was freely stated by several of the leading people engaged in coal cleaning that, if the coal user would pay them enough to make it worth their while to clean the coal, they would do so. It seemed to him that the paper helped to show how much they could afford to pay for that process.

Other Savings Effected

The author showed in his paper that, with three units of ash less in coke, there was a direct saving of 1s. 3d. per ton. In addition there were a number of indirect savings which it was perhaps difficult to calculate, but a good many of which could be seen: Three units of ash less in the coke meant, roughly speaking, about two units of silica less in the coke, and that would mean something of the order of five units of limestone less in the blast furnace charge, and taking an average slag composition something of the order of probably six tons of slag less to handle. In addition there was the increased 1 per cent from the blast furnace which meant saving in labor and saving in book charges, such as interest, depreciation and amortization of the blast furnace plant; and a whole number of other smaller items which he roughly calculated at something like 1s. for the three units.

He also estimated that approximately the three units of ash less in the coke should give a total saving of something over 27d. That was one side of the question, the cost of the coal cleaning. Coke with a diminution of 3 per cent of ash corresponded in round numbers to a diminution of about 2.5 per cent of ash in coal. He had never known of coal being cleaned to only within 2.25 per cent. But the cost of coal cleaning with modern plants, allowing for labor, interest, amortization of plant, and so on, usually came between 4d. and 6d. per ton.

In addition the amount of vendible coal produced was diminished. To get 4½ per cent of ash out diminished the vendible coal by at any rate 10 per cent. Taking coal at 20s. a ton and coke at 12s. 6d. a ton, that gave 15d. to add to the 6d. he had previously mentioned, or 21d. to produce a saving of 6 per cent. If by 21d. of saving of coal it was possible to save twice 27d. or 54d., and reckoning a ton of coke to a ton of pig iron, there was evidently a very considerable margin to play with.

It looked to him as if the author's figures showed the possibility of amply remunerating the coal producer for cleaning his coal and at the same time giving the blast furnace man something to make it worth his while to pay for clean coke. He looked upon the paper as an exceedingly important one because it showed a possibility of paying well for cleaning coal and therefore cleaning coke for the use of the blast furnace man.

Lower Ash Content Important

J. Henderson said he thought the paper illustrated the desirability of regularity, and from that point of view it was important. A calculation had recently been made showing that the saving effected by a reduced content of ash would be not less than 6d. for 1 per cent. Those were the direct savings that could be effected by cleaner coke, and they did not cover the indirect or consequential savings referred to by Professor Louis. The figure might be slightly in excess of 6d. for 1 per cent.

What that was going to cost the maker of the coke he could not say, but they were asked for such a figure by a coke maker, and that was the figure supplied. They were endeavoring to establish some result in practice corresponding thereto. Mr. Gill's paper and the enterprise of the Consett Iron Co. in carrying out such a large experiment was certainly admirable. Lower ash content in the coke was a matter of very first class importance.

Another Investigator's Conclusions Substantiated

The president read the following communication in regard to Mr. Gill's paper received from Dr. R. Lessing, London:

> From investigations extending over many years into the ash forming constituents of coal and their influence on the coking process, and subsequently on the utilization of coke, I have come to conclusions for which Mr. Gill now furnishes corroborative evidence from large scale working. In calculating the economic advantages of low ash in coke, Mr. Gill singled out the item of reduction in coke consumption, which he very fairly estimates at ⅓ per ton of pig for a 3 per cent reduction in coke ash. I have pointed out on several occasions that I consider very much lower ash percentages within the range of practical politics, and I venture to suggest that the increments of savings will grow, the further the ash percentage is reduced, so that for a drop from 9 to 6 per cent the saving in coke consumption may be considerably more than ⅓ as for the first 3 per cent. Moreover, the sum total of the indirect saving due to increased product, more regular product, etc., which the author considers to be "material," will be of an order of magnitude even larger than that from the lower coke consumption. The saving in capital charges alone, which will of course differ widely from case to case, may amount, on the basis of a 25 per cent increase of output for a 3 per cent ash reduction to rather more than 1s. per ton of pig made, to which a few pence will have to be added for relining. The monetary value of an enhanced quality or regularity of the product is difficult to assess, but once the dependence of these factors upon the quality of the coke has been recognized the tendency will be to insist on a fuel which will guarantee such quality, regardless of any saving that might be incidentally effected.

[Other papers presented at later sessions will be reviewed in a subsequent issue.]

Fighting with Machinery

Automatic Gun Pointing Devices, Motor Mounts for Artillery and Special Trucks for Transport Across Soft Ground Demonstrated at Aberdeen

(*Editorial Correspondence*)

WHILE the Army Ordnance Association holds a meeting and demonstration of war material each year at Aberdeen Proving Ground, Md., the representative of THE IRON AGE this year had not been present for the last four meetings. That gave an opportunity to note the developments of those intervening years, especially since the show leaves a vivid and lasting remembrance.

As judged by what was shown at Aberdeen last Thursday, the most notable development in ordnance material is the new fire control for anti-aircraft batteries. Five years ago it was necessary for observers on range finders to phone their measurements to a central operator, who made the necessary calculations to allow for speed of airplane, wind, and flight of projectile. He in turn relayed this information to the gun crew. All this consumed time, and it is not strange that few hits were registered on a target moving at 100 miles per hour, and fewer still on a dodging, diving airplane.

Now all these operations are automatic. Observation and computation are all performed or assembled simultaneously in one fire control instrument. By means of electric motors and gyroscopes placed on the elevator and traverse mechanisms at each gun, any number of guns may be trained automatically and simultaneously on a moving target. Similar devices operate a fuse setter, so all the gun crew has to do is to fire as rapidly as the piece can be served.

Evidence of much higher accuracy was given when firing two guns: the shell bursts would register in pairs, close together. Shooting 50 rounds at a range of 2½ miles, a target towed by an airplane was punctured by 35 shrapnel holes, and one direct hit registered (which would have been disastrous, since fuses have been perfected so delicate that they explode on passing through wing fabric). At the more spectacular night firing, the target was shot down a few minutes after coming within range.

A similar gyro-control has been developed for searchlights, the pointing being done by a listening device. It had no difficulty in discovering an airplane about four miles away in the dark sky. When this audio-pointer is connected to the gun mounts, it will be possible to train guns on aircraft out of sight, above the clouds.

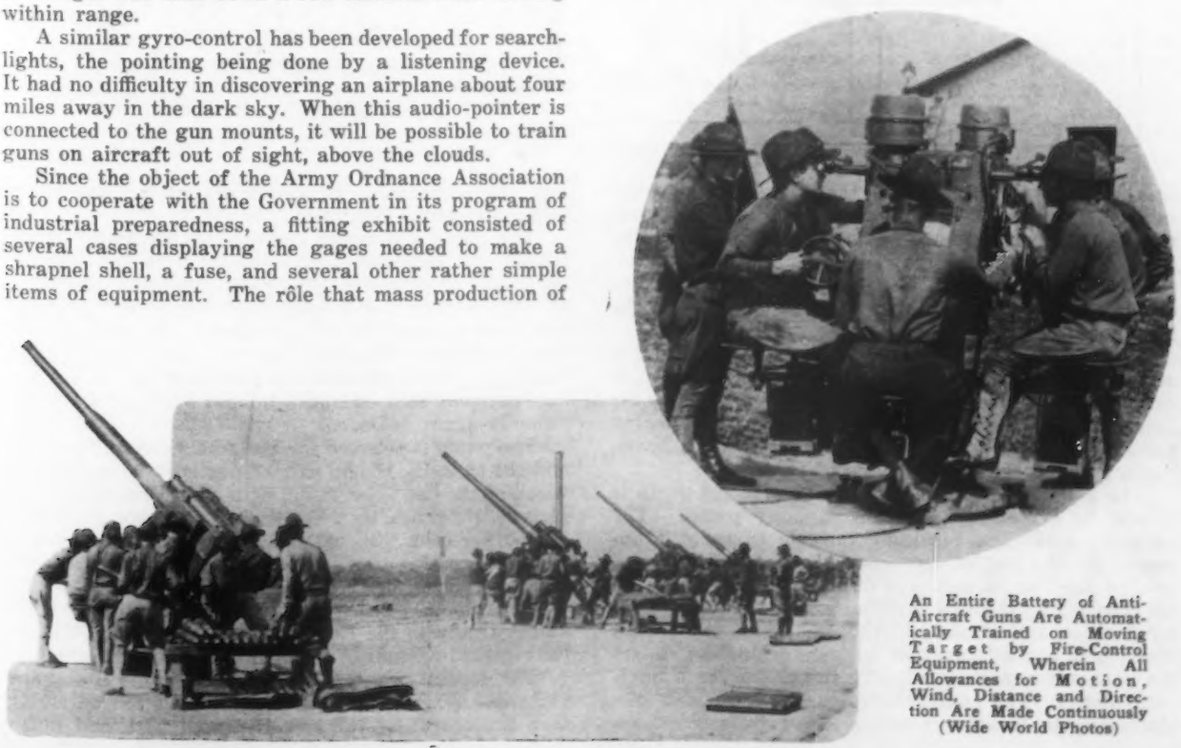
Since the object of the Army Ordnance Association is to cooperate with the Government in its program of industrial preparedness, a fitting exhibit consisted of several cases displaying the gages needed to make a shrapnel shell, a fuse, and several other rather simple items of equipment. The rôle that mass production of interchangeable parts takes in modern ordnance is emphatically shown in these cases—one of which contained over 250 gages.

Transport still depends largely upon commercial trucks (like White, Mack and Pierce-Arrow) and caterpillar tractors, mounting special bodies. However, much attention has been given to several new developments. Among them is the cross country car—in its present shape it is a Chevrolet chassis with a light buckboard body carrying four passengers, and equipped with oversize balloon tires to negotiate soft ground. Similar efforts to become independent of good roads are seen in the 4-wheel Coleman truck, with 4-wheel drive mounted on one balloon tire per wheel; and the 6-wheel truck designed by the Quartermaster Corps, with 6-wheel gas-electric drive, and two balloon tires on each wheel. The elephant of them all is a 15-ton Versare, mounted on two 4-wheeled trucks. These can be swivvelled from the driver's seat, so the ponderous thing can turn almost in its own tracks. Normally, only the front axle steers, and the other three trail. Gas-electric drives are attached to four wheels, and each wheel has one balloon tire.

A Mechanical Army

One had a good opportunity to compare horse-drawn artillery with motor gun carriages in the sham battle. A battalion of 12 75-mm. guns from Fort Hoyle, Md., was present. Encampment for men and horses occupied a 40-acre field. While these guns were being driven up, unlimbered, and made ready for firing, another 75 on a tractor mount (and with a crew of 4 men) had changed its position twice, advancing at about 7 miles per hour, and fired a dozen rounds in each location.

This engagement also brought the new tanks into action. They have lost the trapezoidal shape; are squat and square, much like a flat boat carrying a turret and a conning tower—a real land monitor.



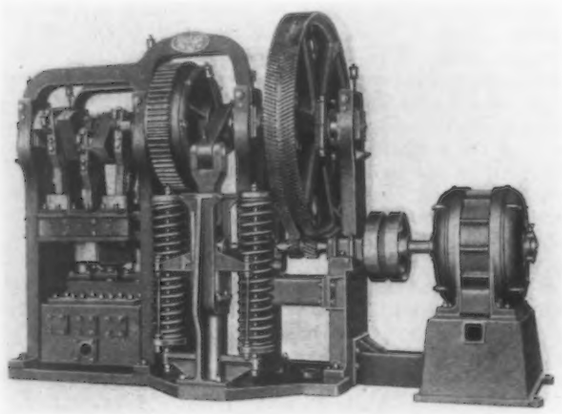
An Entire Battery of Anti-Aircraft Guns Are Automatically Trained on Moving Target by Fire-Control Equipment, Wherein All Allowances for Motion, Wind, Distance and Direction Are Made Continuously (Wide World Photos)

PUMP FOR SHEET ROLLING

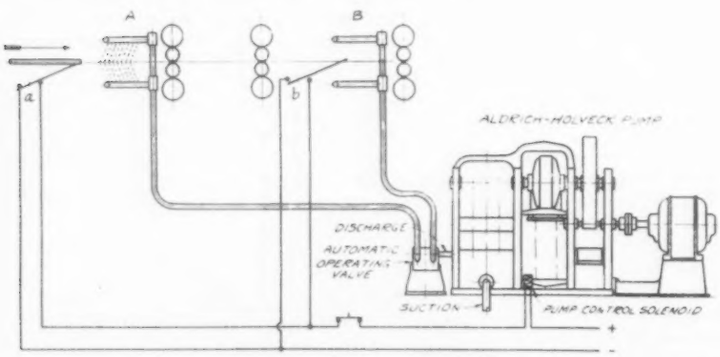
How Automatic Operating Hydraulic Unit Is Applied for Scale Removal

WITH the coming of the speeded-up methods of rolling sheets and wide strip steel and also increasing demand for flawless surface comes a stressing of the problem of scale removal from the slab or sheet bar in the reduction stages before entering the finishing rolls. In the rolling of steel the more complete the absence of scale from the steel in the initial or early passes, the better, of course, are the chances of a finished product with a clean, smooth surface.

To meet the demands, the Aldrich-Holveck variable capacity constant speed triplex pump, here shown, has been built from designs patented by J. E. Holveck of Pittsburgh. It delivers the water at high pressure and



Hydraulic Pump Unit Designed to Maintain Pressure Under Variable Demands Without Using Accumulator



also essays to accommodate the variable and intermittent demands of the mill automatically without the use of an accumulator or variable speed motor. The pump is operated by a standard constant speed motor, either squirrel cage induction or synchronous type. The design aims at maintaining a constant pressure in the lines at all capacities.

While the purposes of the pump are adapted for serving nozzles in the removal of scale from steel, it is naturally applicable to hydraulic work in general, as for furnishing power for presses for forming and forging and the drawing and extrusion of aluminum, brass, copper, lead, steel, carbon, rubber, etc.

The general design and construction of the pump is similar to a standard constant capacity pump. The variable stroke and resultant variable capacity is obtained by the use of two crankshafts connected and rotated together by means of differential gearing. With the crankshafts rotating together and in the same angular position full stroke is obtained. With the cranks rotating in opposite angular position or 180 deg. apart the plungers remain practically stationary for a minimum stroke. The pump, therefore, has a variable displacement at constant rotative speed from minimum (with cranks 180 deg. apart) to maximum (with cranks in unison or 0 deg. apart).

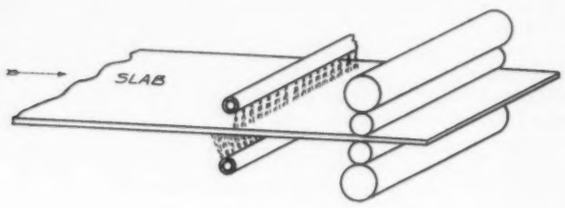
The variable capacity is obtained automatically by means of an hydraulic control cylinder counterbalanced by a spring and the torque of one crankshaft. The capacity of the pump reduces with the tendency of the pressure to increase, and vice versa, the capacity increases as the pressure tends to reduce. The pump is found to maintain very nearly constant pressure through the entire range of capacity from minimum to maximum.

Application to Scale Removal System

The application of this pump for spraying purposes is stated as follows:

A good type of nozzle consists of either 1½-in. standard or extra heavy steel pipe with 5/64 or 3/32-in. orifices spaced in a line approximately 1 in. apart. The arrangement of the nozzles is as shown in an accompanying drawing. The nozzles are located in front of the rolls and at a slight angle thereto, 6 to 8 in. from the bar. The spray is directed to the bar in opposite direction to its motion at an angle of about 30 deg. to blow the scale away from the rolls. The pressure supplied to the nozzles varies from 600 to 1000 lb. per sq. in., depending upon conditions and results to be obtained.

A typical spraying system is also illustrated which sprays a bar alternately. The pump is arranged with an automatic operating valve attached to the pump, which directs the flow first through *A* and then *B* nozzles. This arrangement enables a bar to be sprayed twice with a pumping unit equivalent in capacity to



Nozzles with 5/64 or 3/32-in. Orifices Are Spaced 1 In. Apart

(At Left) Scheme to Show How Sprays Are Automatically in Action Only When Steel Is Passing through Given Rolls

one pair of nozzles. It economizes on the size of the pump and power consumed.

The pump and motor operate continuously, but are loaded and unloaded in accordance with the demand. As the bar trips switch *a* the pump loads and discharges through nozzles *A* and continues to do so until the bar has passed nozzle *A*, when switch is opened and the pump unloads. When the bar trips switch *b* the pump loads and discharges through nozzles *B* (nozzles *A* are automatically shut off) until the bar has passed and the pump is again unloaded.

The pump is selected for the maximum width of bar and the capacity of one pair of nozzles. Assuming the width of the bar to be 48 in., with a corresponding complement of nozzles, then the demand from the pump will be 100 per cent. Should the bar rolled be only 24 in. wide, the nozzles are changed and the demand from the pump will be 50 per cent.

The pump, in short, is designed to adjust itself automatically to the demand of the nozzles and deliver the required amount of water at constant pressure.

The capacity in this case is both intermittent and variable. When it is required to spray a bar once only then the operating valve is dispensed with and pump

discharges direct through one pair of nozzles only, as through *A* in the illustration. The arrangement would be automatic, discharging through the nozzles only as the bar passes between them. In the case of spraying a bar three or more times, each spray is controlled by an operating valve manipulated from the surveying tables. This demand calls for a variable capacity depending upon the width of the sprays and the number of nozzles. The Aldrich-Holveck pump meets this demand, it is emphasized, without an accumulator.

Die for Blanking Intricate Designs at One Stroke of Press

A steel die designed to cut out in one stroke of the press the intricate trade mark here illustrated has been completed recently by A. J. Sossner, 361 West Broadway, New York. The use of one die for this purpose instead of three (one for cutting around the outside of the trade mark and two for cutting the inside) was made practicable by the system of ejector pins employed.

Both the punch and die members contain the ejector pins, which serve to eject the completed stamping and the small pieces punched from the inside letters. These pins are carried in a specially formed plate which

The Die Cuts Out the Trade Mark Shown Below in One Stroke of the Press. The use of one die for the purpose was made possible by the system of ejector pins employed

works in a recess in the back of the die. The plates are backed up by springs. The ejecting action is automatic and positive.

The die is of carbon steel and special attention is given to hardening, as both the punch and die must be free from warpage and register positively. The punch was made first and hardened, and that design was transferred to the die, which was then cut out. When the die was almost to size the punch was sheared into the die lightly under pressure to facilitate fitting. Cutting of the outlines of the letters, etc., was done under a magnifying glass. The punch is made slightly convex. The depth is uniformly maintained at twice the thickness of metal to be blanked. The trade mark illustrated is stamped from brass 1/32 in. thick under approximately 60 tons pressure. It is estimated that a million such stampings can be made from the die with a punch of the height shown in the illustration, which height is adequate for this particular job.

The quality of the work done by this die is said to compare favorably with that of ordinary blanking dies and the life of the tool to be as long or longer. Dies of this design can be used for making a variety of trade marks, etc., of different sizes and shapes.

Gear Makers to Discuss Technical Subjects at Montreal Meeting

A number of addresses and papers devoted to technical as well as general topics have been arranged for the semi-annual meeting of the American Gear Manufacturers' Association, which will be held at the Mount Royal Hotel, Montreal, Canada, Oct. 20, 21 and 22:

These addresses include:

"Some Observations on the Making of American Standards," by Clifford B. Le Page, assistant secretary of the American Society of Mechanical Engineers—Oct. 20, afternoon.

"Worm Gear Inspection and Testing," by George H. Acker, Cleveland Worm & Gear Co., Cleveland—Oct. 20, evening.

"The Effect of Hob Corrections on Gear Teeth," by J. A. Hall, professor of mechanical engineering, Brown University, and consulting engineer Brown & Sharpe Mfg. Co., Providence—Oct. 21, morning.

"Marine Gear Drives," by A. A. Ross, General Electric Co., Schenectady—Oct. 22, morning.

Reports of some 20 technical standardization and other committees will be presented and discussed during the four general sessions of the meeting.

At a dinner meeting arranged for Oct. 21, Herbert D. Casey, superintendent of schools, Easthampton, Mass., will speak on "Reds, Radicals and Reformers." The afternoon of Oct. 21 has been left open for plant visitation, sightseeing, etc. The secretary of the association is T. W. Owen, 2443 Prospect Avenue, Cleveland.

To Confer on Simplification of Turnbuckles

WASHINGTON, Oct. 10.—The Division of Simplified Practice, Department of Commerce, has issued invitations to a general conference on simplification of turnbuckles to be held on Oct. 19 at Atlantic City. Accompanying the invitations are recommendations made by a committee of manufacturers appointed at a preliminary conference.

The division has received replies from most of the questionnaires sent in regarding proposed simplification of jack chains, and plumbers, safety register and ladder chains. The committee in charge of the survey on chains is headed by A. B. Way, Turner & Seymour Mfg. Co., Torrington, Conn. It is expected that a conference of manufacturers will be held in about two weeks.

New York University Offers Course in Safety Work

New York University, New York, on Monday, Oct. 3, started the second year of a course for the training of safety engineers. This course was instituted a year ago in response to an increasing demand from industry for men trained in safety work. Last year's enrollment was 55. Lectures are held in the evening.

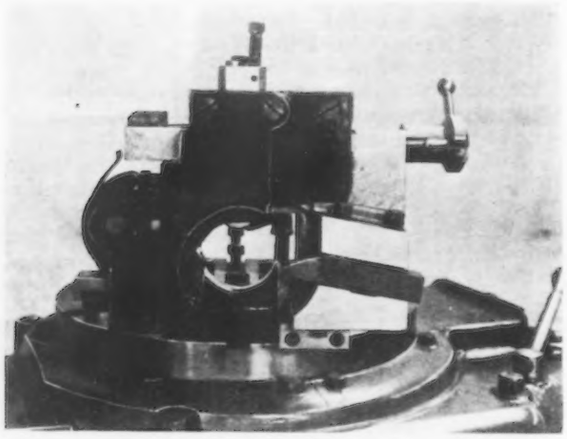
The course is given under the direction of C. W. Price, consulting safety engineer, formerly director of safety International Harvester Co. and general manager National Safety Council. He is assisted by Dr. E. George Payne, professor of educational sociology New York University and chairman education section National Safety Council; Louis Resnick, former director of publicity National Safety Council; W. Graham Cole, director of safety Metropolitan Life Insurance Co. and formerly safety engineer Bethlehem Steel Co.; C. S. Carstens, safety engineer Metropolitan Life Insurance Co.

New Taper Turner for J. & L. Turret Lathes

The Jones & Lamson Machine Co., Springfield, Vt., has brought out a taper turner, designated as the Model M, for use on its flat turret lathes.

The device is a departure from the company's former designs in that it may be used in two ways: First, in turning tapers from the rough bar, in which case the cutter precedes the rolls, and, second, in turning tapers from finished stock or from bars already turned straight. In the latter case the rolls precede the cutter and bear upon the surface previously finished. The template is of the same size and shape as that of the company's Model K taper turner. It should be about 2 in. longer than the length of the cut, so that the end can be pointed to facilitate entering. The angle of taper on the template should be one-half the included angle of the taper on the work.

The turner illustrated is set up to turn tapers from the rough bar. For this work a cutter made of 1 in. square stock is used. The cutter can be adjusted for height by a screw directly under it. After it is placed the rolls are adjusted to it. These rolls are made with one edge slightly chamfered and the other edge ground to a radius of ⅛ in. For shallow tapers—not over ⅛ in. to the foot—the sharp corner of the



The Device May Be Set to Turn Tapers from the Rough Bar (as Above) or from the Finished Stock

roll should be next to the cutter; for steeper tapers the round corner should be used.

In adjusting the rolls a short taper is turned on the bar. The rolls then are adjusted to this taper so that the contact is just enough to turn them when the work is revolved. Adjustment for the rear roll is obtained by turning the screw against which the upper rocker arm bears. Adjustment of the upper roll is obtained by turning the screw directly under the size adjustment knob. In using the turner for cutting tapers with the rolls preceding the cutter, it is necessary to use a cutter made of ½ x 1 in. stock.

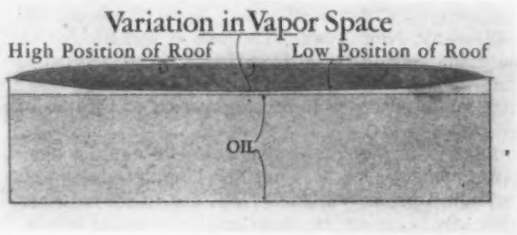
Resistance of Gages to Wear

A series of tests have been made in a machine designed by H. J. French at the Bureau of Standards to reproduce the action of inserting go and no-go plug gages in work. Chromium plated steel gages had the highest resistance to wear when gaging file-hard high-carbon steel, an aluminum piston alloy, and a cast iron containing appreciable proportions of pearlite. Ammonia-treated chromium-aluminum steel, marketed under the name "Nitralloy," was second in resistance to wear and much superior to the remainder of those tested. In general, file-soft gage steels showed somewhat better resistance to wear than corresponding steels in the file-hard condition, and this difference was most noticeable in an oil hardening tool steel.

In tests made in the presence of a non-metallic abrasive, gages made of stellite, of a high-carbon high-chromium iron alloy, and chromium plated gages showed better resistance to wear than the customary high carbon steels or Nitralloy.

"Breather" Roof for Expansion in Oil Storage Tank

Said to be a new device in the oil industry, the Wiggins breather roof is designed to stop evaporation from storage tanks. It is made of steel plates welded together much the same as an ordinary steel roof. The distinctive feature of the "breather" is that the roof framing is designed so that the roof, when resting on it, dips below the top of the tank shell and forms a surface which is concave upward.



Oil Storage Tank of 80,000 *Barrels Capacity, in Seminole Field, Equipped with Wiggins Breather Roof*

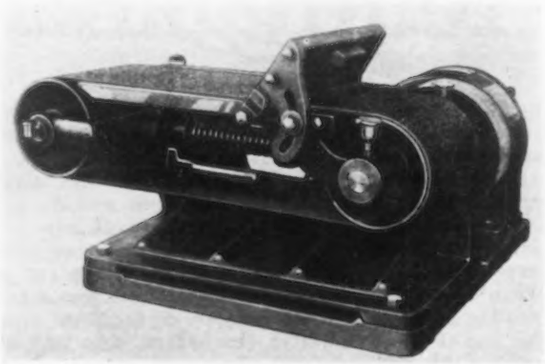
The roof plates are not fastened in any way to the roof framing. When the tank is full of oil in standing storage, and the small vapor space above the oil becomes heated and expands, it lifts the roof enough to take care of such expansion without allowing vapor to escape. When the hot part of the day is over and the vapor cools, the roof settles back to its former position.

Conservation of oil is being practiced, not to restrict the use of oil products for legitimate purposes, but to cut down unnecessary wastes. This new breather roof, by providing for the expansion and contraction of vapor above oil in a tank, prevents evaporation from standing storage tanks. The roof is made by the Chicago Bridge & Iron Works.

Abrasive Band Grinder

To avoid overhead transmission, a small motor-driven band grinder (sometimes called sander), known as the Simplex-B-M, has been placed on the market by the Walls Sales Corporation, 96 Warren Street, New York. This machine has the regular quick-change band feature and the abrasive band lies flat on the table when the pulleys are in working position.

The band operates on a table 18 in. long and 10 in. wide, the band being 8 in. wide and 61 in. long. It



Motor-Driven Band Grinder or Sander for Finishing Metal, Composition or Wood Parts

may be brought to any fixed position by adjusting two thumb screws. The bevel attachment, shown, can be removed when the work does not require it. Power is furnished by a 1-hp. motor operating through an internal gear drive and mounted on the base of the machine. The grinder speed is 875 r.p.m. The machine weighs 426 lb. and occupies bench space of 28 x 31 in.

Portable Alternating-Current Instruments for Industrial Plants

A new type of portable alternating-current instrument, designated as the type AS-2, for general testing and inspecting work in industrial plants and power stations, has been announced by the General Electric Co., Schenectady. It is of repulsion type and, while primarily intended for use on alternating-current circuits, can be used also on direct current.

Both ammeters and voltmeters are supplied, and both are double rated. Ammeters are furnished self-

Portable A. C. Instrument for General Testing and Inspection Work. Both ammeters and voltmeters are supplied

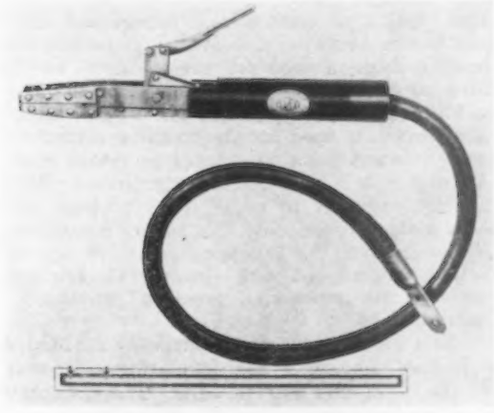
contained in ratings not exceeding 20 amp. For higher ratings, 5-amp. instruments should be used with current transformers. Voltmeters are supplied self-contained in ratings not exceeding 300 volts. For higher voltage ratings, external portable multipliers are available.

The scale length is approximately 3 in. The case and cover are of molded bakelite, made to resemble morocco leather. The cylindrical switch and binding posts are below the scale, and are protected by a hinged cover with a snap lock. Each instrument is provided with a zero adjusting device. The instrument measures 3½ x 5¼ x 1⅞ in. and weighs 18 oz. It is designed to fit in the coat pocket but a leather carrying case with shoulder strap can be supplied.

Welding Electrode Holder

A new holder for metallic arc welding electrodes of all classes, but especially surfaced electrodes, has been developed by the Fusion Welding Corporation, 103rd Street and Torrence Avenue, Chicago.

When the electrode is placed in the holder the jaws clamp and the electrode is pushed forward automatically. This movement scrapes the surface material from the four points of contact, assuring proper contact, which in turn is stressed as minimizing overheating of the electrode. Spattered weld metal will not stick to the jaws of the holder. The electrode stub may be removed and a new electrode loaded conveniently. The weight of the holder is 2 lb.



The Electrode Is Pushed Forward Automatically and Surface Material Is Scraped from the Points of Contact

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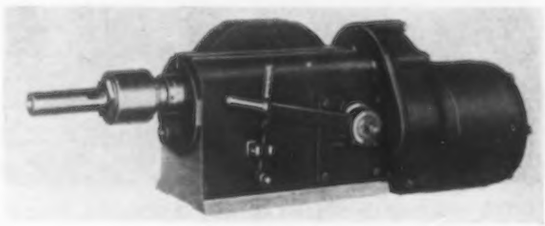
Unit Type Drilling and Tapping Head

Unit type drilling and tapping heads for high-speed automatic drilling, tapping, countersinking and reaming operations have been placed on the market jointly by the Demco Drilling Machine Co., Cleveland, and the Bradford Machine Tool Co., Cincinnati.

These heads are available in two sizes. They are of self-contained type with the motor and feed mechanism built into one compact unit, and one or more of the heads may be mounted on one machine, at any angle from horizontal to vertical.

The heads operate on a predetermined cycle, having a definite spindle travel of 3 in. with a 2-in. adjustment. The cycle of operations is: Rapid approach to the work, actual cutting feed, and rapid return after the operation is completed. The cycle of operation is imparted to the spindle by means of a positive feed cam, driven by a clutch from the spindle. This cam makes one complete revolution or cycle each time the starting lever is depressed, the feed mechanism then remaining idle until engaged again by the operator.



The Motor and Feed Mechanism Are Built into One Compact Unit for High-Speed Automatic Drilling, Tapping, Countersinking and Reaming Operations

To make the operation continuous or automatic, the trip-dog for the starting lever is disengaged. An emergency lever is provided for instantly stopping the entire mechanism.

Spindle speeds can be varied from 75 to 2000 r.p.m. by means of pick-off gears in the housing between the motor and drill head. A rate of feed from 0.005 to 0.030 in. per revolution is available by changing other pick-off gears, which are accessibly located and may be reached by a cover at the side of head. The depth of the actual feed in relation to the constant cycle can be varied by changing the cam. A power take-off rod extending through the front of head is provided for automatically clamping or locating work, while the automatic indexing or dial feed is accomplished through a crank arm, attached to a stub shaft, extending from the side of the head, this stub shaft making one revolution periodically during each cycle.

The tapping mechanism, which is built into the head and makes a complete unit, employs a positive rise cam for the desired lead to the spindle to correspond to the tap lead. The return of spindle is also controlled by the cam, and therefore does not depend on the tap for its return; the entire operation is according to a predetermined cycle governed by the cam and pick-off feed gears. The range of speed on the tapping spindle is the same as the drilling spindle, while a thread lead from 8 to 32 threads per in. can be obtained with standard pick-off gears.

Two sizes of heads, designated as the No. 1 and No. 2, respectively, are now in production. Capacities are as follows: No. 1 head, drilling ¼ to ¾ in., tapping ¼ to ½ in.; No. 2 head, drilling ¾ to 1⅛ in., tapping ½ to 1 in. The smaller head requires a 1-hp. motor, and the spindle has a No. 2 Morse taper. The larger head requires either a 2- or 3-hp. motor and the spindle has either No. 3 or No. 4 Morse taper. The spindles are arranged to receive standard makes of multiple drill heads. Alemite system of lubrication is used.

Automatic Bottom Welder for Cylindrical Tanks

A new carbon arc automatic welding machine designed by the Lincoln Electric Co., Cleveland, for the welding of bottom seams on cylindrical tanks is shown in the accompanying illustration. The machine is here illustrated as applied to range boilers.

The equipment is standardized for tanks up to 6 ft. in diameter and 8 ft. high, but special equipment can

The Machine Is Standardized for Welding Tanks Up to 6 Ft. in Diameter, 8 Ft. High

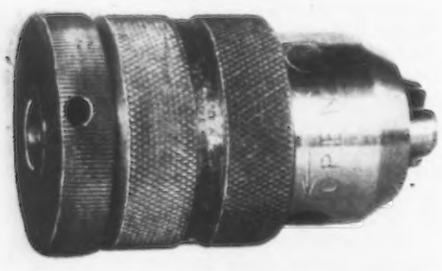
be furnished for welding the bottom seams of tanks of other diameters and lengths. On 14 gage material lap head seams, such as shown on the tanks in the illustration, have been welded at the rate of 135 ft. per hr. It is stated that the edge weld used on the bottom of some types of range boilers may be welded at the rate of 150 ft. per hr., as the bottom is flanged and fitted so that the edges are together and flush with each other.

Tanks which are to have the bottom seams welded are set on the revolving table and the arm carrying the automatic welding head is adjusted to bring the arc on the seam. The speed of the revolving table is adjustable over a wide range to suit tanks of various sizes. Welding current is adjustable through the controls located on the welder control panel. The operator has automatic stop and start control on the automatic welder head.

Self-Tightening Drill Chuck

A keyless self-tightening ball-bearing drill chuck has been added to the line of the Eastern Tube & Tool Co., 594 Johnson Avenue, Brooklyn, N. Y.

This chuck, marketed under the trade name of Ettco, is intended for use on electric and air drills, and also on flexible shaft units. It is self-tightening and has a continuous grip, the grip increasing as the load on the chuck increases. It is claimed that no matter how tight the chuck grips, it can be released by hand by a quick twist of the wrist. The holding collar on the top of the chuck is held by the operator to prevent the drill from turning when opening or closing the chuck. This arrangement is stressed as eliminating certain abuses that electric drills are subject to, such as using a nail in the ventilating holes to prevent turning of the armature. This type of chuck with holding collar is furnished with any thread or taper to fit the standard makes of electric and air drills now on the market.

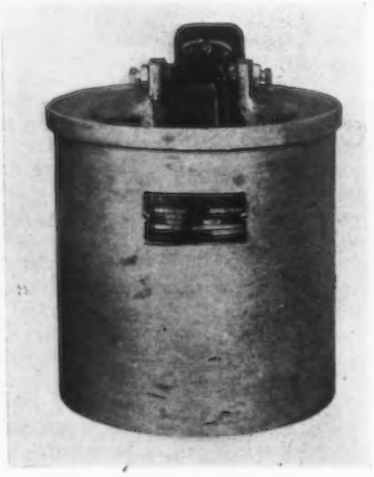


The Chuck Is Self-Tightening, and the Grip Increases as the Load Increases. Keys Are Not Used, the Chuck Being Closed by Hand

Small Capacity Melting Pot

For melting solder, lead, babbitt, tin, etc., a new electric melting pot has been introduced with capacity from 27 to 40 lb., according to the metal to be melted. This pot may be operated on either 110 or 220-volt a. c. or d. c. circuits and is made by the General Electric Co.

It consists of a sheet steel cylindrical casing 10 in. deep and 9 in. in diameter, in which is supported a cast-iron crucible 4 in. deep and 6 in. inside diameter. The space between the casing and crucible is insulated. Heating units are of the cast-in, sheath-wire type. One unit is used in each pot, dissipating 750 watts in one rating, and 1000 watts in the other. The leads of the unit are brought over the top of the pot into a connection box fixed to the unit itself.



The Pot May Be Operated Either on 110 or 220-Volt A. C. or D. C. Circuits. Heating units are of cast-in sheathed-wire type

The new pot is designed for melting at temperatures not exceeding 950 deg. Fahr. Detailed capacities are: for 50-50 solder, 30 lb.; for lead, 40 lb.; for babbitt, 37 lb., and for tin, 27 lb. The approximate shipping weight is 50 lb.

Two Electric Heating Applications in a Railroad Shop

The heating of pinions and lubricating oils used for car journals and motor bearings, as well as heating a cleaning solution used for greasy metal car parts, is being done at one of the carhouses of the Los Angeles Railway in Los Angeles. One 24-gal. tank, electrically heated, is used for the cleaning compound. It is made of sheet metal, insulated to retain heat.

A small tank is used for heating pinions. This has a capacity sufficient to cover three pinions at once. After a pinion is immersed, the boiling point temperature is maintained for one hour before it is removed. This tank is equipped with General Electric heating elements of the immersion type and having a load capacity of 6 kw.

To heat oil for lubricating purposes a round metal tank is used, having a heat-insulating compound between the inside and outside walls. The General Electric heating units used are of the clamp-on type and are embedded in the heat insulation and thermostatically controlled. The tank has a capacity of about 10 gallons.

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

Statistical Data Concerning the Chief Consuming Industries Indicate That:

1. Steel ingot production in September made a logical decline and was closer to the level of composite steel demand.

2. Trend in chief consuming industries appears to foreshadow a moderate further recession before any recovery comes.

3. Car and locomotive orders were the lowest for years and early recovery is not expected.

4. Structural steel sales in August were far below the July peak, but a further decline may be registered by the September figures.

5. Exports declined in August and probably had small profits at the low prices current.

6. Sales of finished steel in August were about the poorest of the year.

7. Automobile production is not in for a real slump, but the old, high levels will not soon be regained.

8. General manufacturing activity, outside steel and automotive industries, has a bright aspect.

9. Oil production is so far above requirements that a long period of adjustment must be faced. Coal mining has increased.

10. Farm purchasing power is better, as incomes are higher.

THERE seems to be little new to be said about the relation between demand and supply in the steel industry. A little recovery occurred in the composite activity of the chief iron and steel consuming industries during August, but the indications are that for September a further recession of moderate proportions will be shown.

There is, however, no suggestion of any such sharp downward trend in demand as occurred in early 1924. As to supply, after the unfortunate spurt of activity in August, the production of steel ingots in September followed the logical course and showed what seems to be a sharp decline, especially considering the usual seasonal trend.

The main conclusion is that production of steel last month was well inside the indicated requirements of the country. This fact holds out hope that inventories will soon be reduced where excessive, and that the normal demand, meeting a reduced supply, will cause stronger markets before the year is over.

The chief factors in causing the August upturn in our composite demand line, strangely enough, are found in the activity of exactly those industries which have been most backward in actual buying of steel—automobile manufacturing and railroad transportation. Both were much below the average for the year and the earlier trend in both cases has been downward. But both gained more than usual in August, indicating that the later trend was upward.

Moderate Improvement Expected in Demand

Building activity was sustained, as was general manufacturing. In fact, the only decline occurred in exports, the drop to 175,600 tons of iron and steel shipped abroad being considerably greater than usually occurs in August. Even the exports were a little over a year ago, but this is probably not significant, in view of the fact that August, 1927, had one more working day than August, 1926.

As to the future, it must be admitted that the outlook is not entirely clear, but unless the usually trustworthy barometers of industry are to fail, a moderate improvement is to be expected during the remainder of the year. It is reasonable to expect a good gain in freight traffic beginning with this month, such an expectation being based chiefly on forecasts of general business improvement: e.g., a rise in our P-V line, indicating a normal balance between supply and demand, confirmed by the firmness of commodity prices.

While no great gains are to be anticipated in building and construction activity, the general opinion that it should continue to furnish a fair volume of business

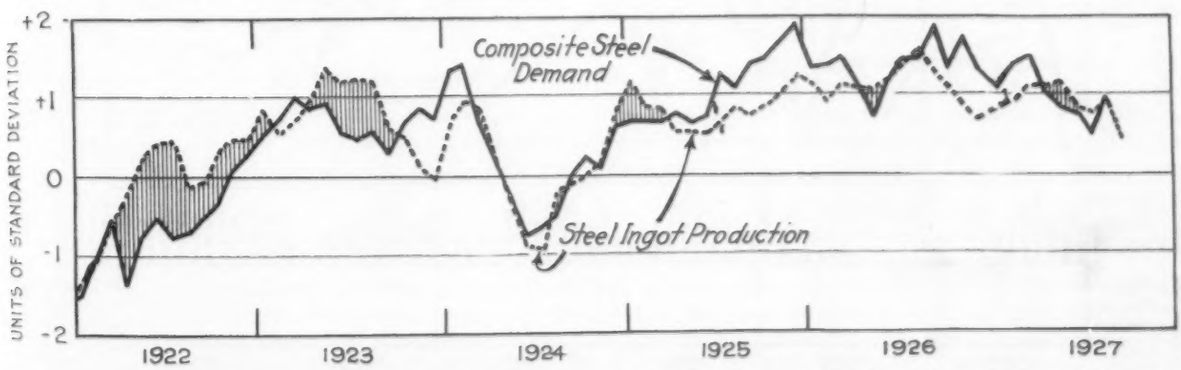


Fig. 1—Steel Ingot Production, Adjusted for Seasonal Variations, Has Reached Close Agreement with Demand. Improvement in business may follow shortly

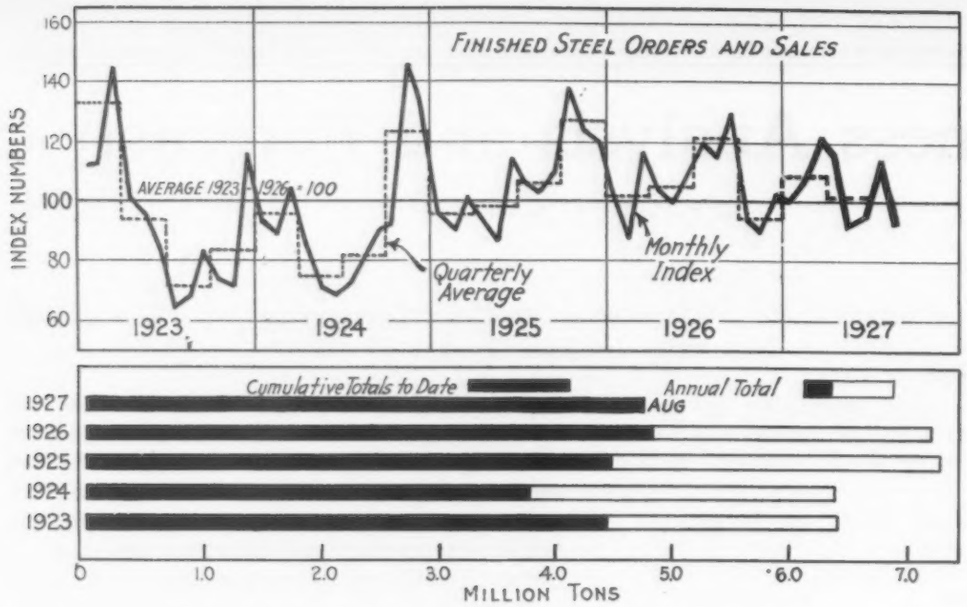


Fig. 2—Finished Steel Orders and Sales Showed a Sharp Drop in August, Canceling the Rise in July. First eight months' business is estimated as ahead of all preceding years except 1926, which is closely approached

seems justified. Further declines in residential building are likely to be offset by increases in public works, etc. Conditions in the money market, which are important in determining the trend of building activity, certainly continue favorable. But one of the less favorable elements in the business future is the lack of the very large volume of urban building that characterized 1925 and 1926. This is requiring some readjustment in industrial activity.

Manufacturing Gains Foreshadowed

The outlook in general manufacturing activity is for gains. The improvement in the buying of machine tools is particularly to be noted in this connection. Machine tool orders, considering the season, reached the high point of the year in August and the prospects appear to be favorable for fall business. The automobile industry, which we consider separately, appears to be in somewhat the same situation as building. We think that the edge is off of automobile buying and do not expect a return to the old high levels for a long while; but neither do we see any real slump in prospect. September estimates indicate a decline in automobile production somewhat greater than seasonal.

Under the influence of increased coal production, our index of mining activity has risen and in general mining should furnish a fair demand for steel. The oil industry, however, approaches the winter season in such a condition as to over-production that it is evident that a long period of readjustment will be required. About all that can be said is that drilling activity has fallen to a very low level and that the upward trend of crude oil production has been checked. These facts indicate that the basis for a gradual improvement has been established.

Farm Buying in Better Volume

Agriculture furnishes one of the brightest spots in the outlook. Farm prices are more favorable than they have been for a good many months and the quantity of farm products marketed is sufficiently large to insure gains in farm consumption. This conclusion is confirmed by the large volume of mail order sales and the activity in the agricultural implement industry.

Concerning the export outlook, we can only repeat the opinions expressed in preceding discussions, which is that, even if the volume is maintained, which is doubtful, the business will be secured at the expense of prices and profits.

The net conclusion is that some improvement in demand for iron and steel is in prospect, but the

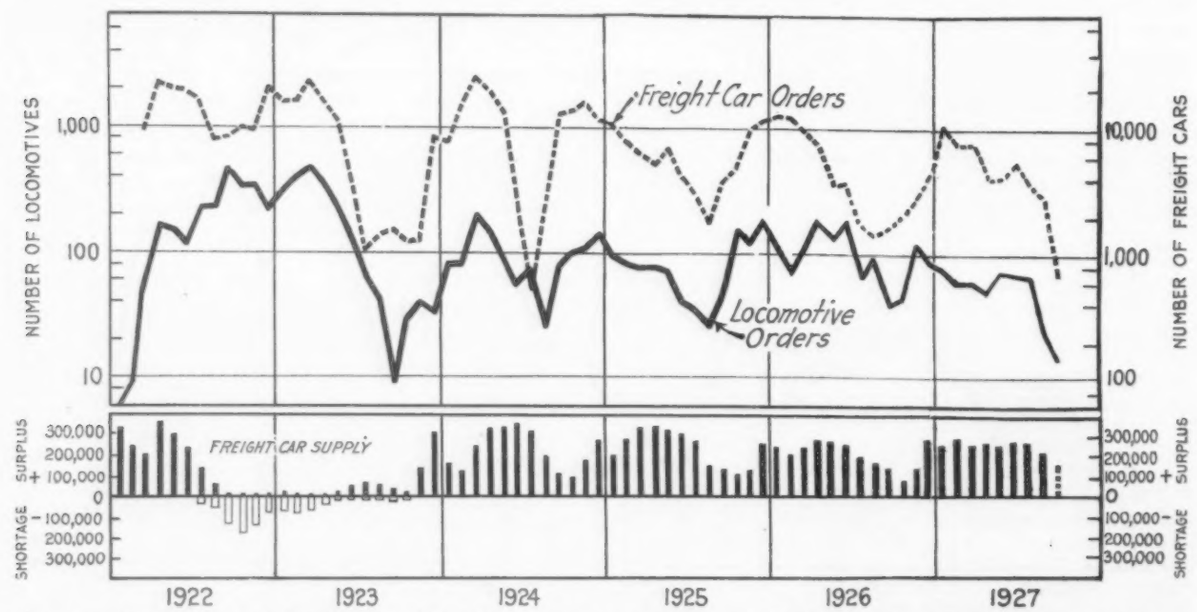


Fig. 3—Locomotive and Car Orders Made New Lows in August and Unfilled Orders Declined to the Lowest Point in Years. Both curves are plotted as a 3-month moving average

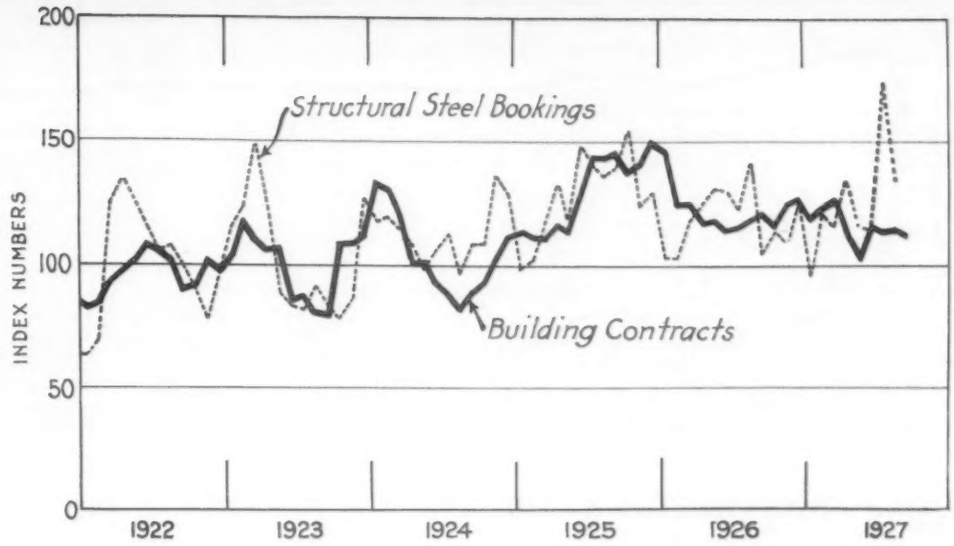


Fig. 4—Building Construction Continues at a High Rate, Though Lower Than a Year Ago. Structural steel lettings, high in July, declined sharply in August and may go lower

situation is so mixed that it does not suggest anything more than moderate gains.

Orders and Sales Not Impressive

OUR August index of orders and sales covering some of the chief items of finished steel does not make a favorable showing. The most significant points are found in the two facts that (1) the total orders and sales for the first eight months fell behind those for the same period last year, and (2) August orders and sales fell to a point as low as was reached last May, which is the first time since 1923 that such a relative situation between these two months has occurred. That August was one of the poorest months of the year for steel sales is the more notable in that it contained so few Sundays.

It is thus clear that the early fall business is very backward and this makes it seem probable that the volume for 1927 will fall behind that of a year ago. It will be noted, however, that the cumulative totals through August have shown little relation to the totals for the years. In 1924, for example, the eight-month total fell far behind 1923, although the totals for the two years were practically the same. The peak of orders and sales in 1924 came in November, in which month there was a large and sharp recovery. While there is no probability of any such large recovery this year, in view of the more ample supplies, and it does not seem likely that September figures will make a very favorable showing, we still think that October and November will register good gains.

The chief decline in orders and sales during August occurred in the case of sheets. Sheet sales reached much the lowest point of the year and were less than one-half the quantity sold in August, 1926. But all the chief items, except fabricated steel, declined in August and all were smaller than a year ago.

Unusually Low Railroad Purchases

RAILROAD equipment demand has shown no improvement. Instead, new lows were reached in September. Only 40 freight cars (tank cars) are reported to have been ordered in that month. This makes it the lowest month on our record. The orders compare with 2564 cars bought in August, 1926. Even the average of the last three months is the lowest for any three months since the period ended with July, 1924. The average for the last three months was 651, which compares with 1638 in the same period last year.

In view of the poor showing made by railroad earnings in recent months, and the ample supply of equipment possessed by the carriers, there is little prospect of anything but a moderate seasonal gain in freight car buying during the rest of the year.

Orders for locomotives declined sharply in September and the unfilled orders on the books of the locomotive manufacturers fell to the lowest point reached since January, 1922. *Railway Age* reports but six orders during the month, which compares with 31 last year and 86 in September, 1925. The average number ordered during the three months ended with September is the lowest for the period since the autumn of 1923. As to the future of locomotive orders, much the same may be said as in the case of freight cars.

Building Contracts Tapering Off Sharply

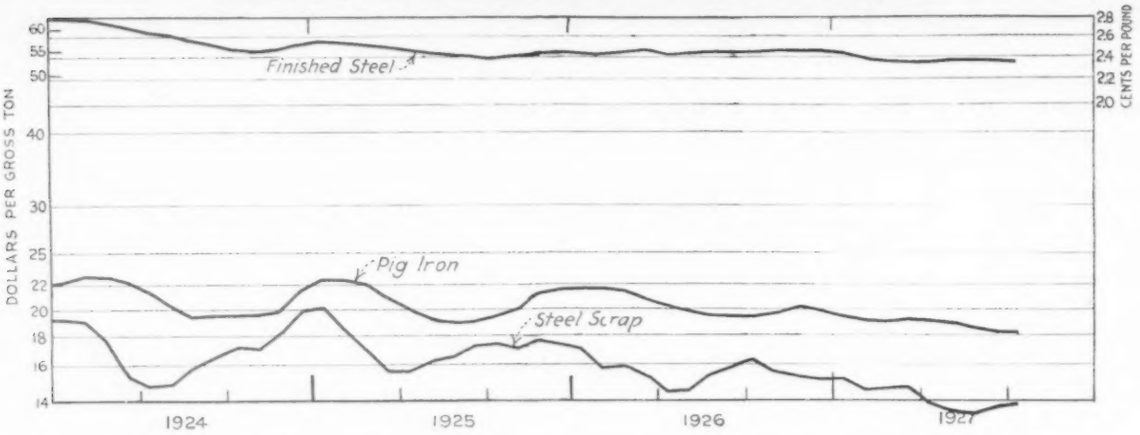
AS shown in the fourth chart, the floor space in building contracts awarded during September, according to F. W. Dodge Co., declined more than usual for the season. This makes the general trend of building activity appear to be slightly downward, beginning with last June. The 67,740,000 sq. ft. of floor space contracted for last month compares with 74,473,000 sq. ft. in September, 1926.

August bookings of structural steel fell off rather sharply from the July peak, and the figure was still so far above the usual relation with the building activity curve that a further decline will probably be shown by the September data.

It should be noted, however, that contemplated new construction increased in September, making due allowance for the season, and building activity, though considerably below last year, may fairly be said to be well sustained at a moderately high level.

Schedule of the next installments of the Business Analysis and Forecast, by Dr. Lewis H. Haney, Director New York University Bureau of Business Research, follows: Oct. 20—Position of Iron and Steel Producers; Oct. 27—General Business Outlook; Nov. 17—Activity in Steel Consuming Industries.

After Touching the Lowest Level in Some Years the Steel Scrap Composite Price Has Started Its Fall Recovery. Pig iron and finished steel, also, are unusually low



SCRAP PRICE DECLINE CHECKED

Pig Iron and Finished Steel Are Lower Than for Some Time Past

AVERAGE prices of heavy melting steel scrap at Chicago, Pittsburgh and Philadelphia have moved upward slightly from the low level of the second quarter of the year. July at $13.48 showed the lowest average for any month in several years, but August at $13.80 and September at $13.92 showed a recovery which was participated in by all three markets. The average for the quarter, however, at $13.73, was considerably lower than for any other quarter in more than five years. It was $14.09 in the second quarter of this year.

Pig iron reached in September the lowest level since before the United States entered the World War. The composite price average for the month is $18.03, compared with $18.17 in August. For the third quarter of the year the average was $18.29. This compares with $19.07 average for the previous quarter, and with $19.48 for the third quarter of 1926.

Finished steel, while it has maintained a measureably uniform price for some months, averaged lower in September than in any month since August, 1922. The average was 2.357c. a lb., compared with 2.367c. for each of the two preceding months. For the quarter the average was 2.364c., compared with 2.363c. in the preceding quarter. Fluctuations in the finished products prices are much less violent than those in either pig iron or steel scrap. By diagram and in the table the three composite prices are shown. The table covers 33 months, while the diagram traces the history of these movements from the beginning of 1924.

COMPOSITE PRICES ON IRON AND STEEL PRODUCTS

(Per Gross Ton)

	Steel Scrap	Pig Iron	Finished Steel, Per Lb.
January, 1925	$20.10	$22.44	2.560c.
February	18.27	22.50	2.546c.
March	16.92	21.99	2.537c.
April	15.48	20.95	2.503c.
May	15.46	19.85	2.460c.
June	16.09	19.22	2.440c.
July	16.46	18.96	2.435c.
August	17.23	19.01	2.413c.
September	17.42	19.38	2.397c.
October	17.08	19.92	2.405c.
November	17.63	21.17	2.433c.
December	17.37	21.54	2.450c.
Year's average	*17.12*	*20.58*	*2.465c.*
January, 1926	16.97	21.79	2.447c.
February	15.50	21.77	2.428c.
March	15.83	21.65	2.433c.
April	15.27	20.96	2.439c.
May	14.35	20.69	2.416c.
June	14.40	20.00	2.420c.
July	15.42	19.51	2.431c.
August	15.88	19.46	2.431c.
September	16.25	19.46	2.439c.
October	15.58	19.69	2.449c.
November	15.25	20.13	2.453c.
December	15.08	19.94	2.453c.
Year's average	*15.48*	*20.42*	*2.439c.*
January, 1927	15.17	19.44	2.432c.
February	14.58	19.07	2.378c.
March	14.65	19.03	2.367c.
April	14.71	19.21	2.360c.
May	13.95	19.09	2.360c.
June	13.60	18.92	2.369c.
July	13.48	18.56	2.367c.
August	13.80	18.17	2.367c.
September	13.92	18.03	2.357c.
9-month average	*14.21*	*18.84*	*2.373c.*

Fewer Steel Workers, But Higher Wages

Iron and steel workers in 206 "identical" plants numbered 262,739 in August, compared with 266,027 in July, according to a report of the United States Bureau of Labor Statistics. This represented a drop of 1.2 per cent. The payroll for a week in August, however, at $7,746,205, was 4.9 per cent higher than the corresponding figure for July, at $7,382,581.

In 965 plants turning out foundry and machine shop products there was a decrease of ½ per cent in the number of workers, from 237,501 to 236,217. Meantime, however, wages advanced 0.9 per cent, from a total payroll in one week in July of $6,837,930 to $6,902,317 in August.

Shipments of Sheet Metalware

August shipments of enameled sheet metalware are reported by the Department of Commerce at 330,746 dozens, valued at $1,278,257. Both figures are the highest since last spring. They compare with the year's low of 248,893 dozens in July, valued at $887,603.

Galvanized sheet metalware was shipped in August to the total of 234,820 dozens, valued at $676,982. This again is a large increase over the July shipments, which were 160,648 dozens, valued at $602,551. It represents, however, a much lower movement than in the spring months.

Locomotive Shipments Improved

Shipments of railroad locomotives in September are reported by the Department of Commerce at 127, compared with 81 in August and 60 in July. Except for March, the September total was the largest of the year. The improvement was due mainly to export shipments, which totaled 28 steam and 6 electric units in September, compared with only 4 units (steam) in August. Domestic shipments included 86 steam and 7 electric in September against 71 and 6 in August.

Shipments of the first nine months were 35 per cent below last year, having amounted to only 838 against 1291. Of the total, 689 were for domestic and 149 for export, compared with 1097 and 194 last year. Unfilled orders at the end of September had fallen to 271—the smallest figures in many months. It compares with 363 on Aug. 31 and with over 700 in several months of 1926. Of the current total, 216 are for domestic delivery and 55 for export, about one-quarter of each of these figures representing electric units.

BLAST FURNACE PROBLEMS

Eastern States Association Also Discusses Coke Oven Operation

The quarterly meetings of the Eastern States Blast Furnace and Coke Oven Association are usually interesting and helpful, but it was a common remark at the conclusion of its fall meeting held at the Shannopin Country Club, Ben Avon, Pa., Friday, Oct. 7, that this meeting excelled in those features any previously held since the organization of the association in 1921.

Round-table discussions, in two groups, one given over to blast furnace topics and the other to coke oven practices and operation, introduced an innovation and produced such free and comprehensive consideration of various phases of both branches of the industry that they are likely to be adopted as a regular feature of future meetings. It is probable, however, that the meetings will not be split into groups, since there is interest among the blast furnace men in the subject of coke, and the oven operators likewise want to be informed on the developments in blast furnace operations.

The blast furnace group discussed the use of cooling plates above the mantel and had some very interesting information on the results attending such installations in the furnaces of the Sloss-Sheffield Iron & Steel Co. Stove construction, with the side and central combustion chambers, the size of checkers, metallic support for checker work and the automatic hot blast control received a large measure of attention. Pressure burners for stoves and boilers were generally regarded with favor, but one speaker urged that they were not intended to work on dirty gas.

Discussion of the 1000-ton blast furnace and its dimensions indicated that such a furnace was not far off. It was stated that in moving toward such a furnace more progress had been made in hearth design than in top development.

It was the unanimous opinion that the sintering of flue dust was justifiable, although one speaker told of some very highly satisfactory results from a charge containing 20 per cent of unsintered flue dust. The handling of sludge from wet washers provided much interesting debate and disclosed a wide difference of opinion as to the value of thickeners and filters, particularly in the elimination of moisture. Some advocated settling pits as a satisfactory method of drying the wet flue dust.

H. S. Braman, Youngstown Sheet & Tube Co., Youngstown, Ohio, presided at the blast furnace session. Caleb Davies, Republic Iron & Steel Co., was chairman of the coke oven group, which for the most part considered ways and means of improving the quality of the product of the ovens.

C. A. Meissner, chairman open-hearth, blast furnace and coke oven committees, United States Steel Corporation, was the speaker following the dinner in the evening. He reviewed many of the topics discussed during the afternoon and then in order took up recent developments in coal, coke, blast furnaces and open-hearth practice. He stressed the need of uniformity in coke and indicated that with the passing of rich ores and the best of the coal, the washing of coal prior to coking was bound to receive more serious consideration. He thought the industry still was weak in the matter of blast furnace gas washing and indicated that the handling of sludge from the wet washers was the greatest of the minor problems confronting the blast furnace men. Touching on furnace lines, he suggested study of the furnace periphery, drawing attention to the fact that the performance of many small furnaces was relatively as good as the larger units. He made a strong plea for an abandonment of tradition in making changes in existing plants and units; to rebuild to improve and modernize and not on the basis that "this was not the way it used to be done."

There was a registration of almost 150. The committee on arrangements comprised D. E. Price, Koppers Co., Pittsburgh, Harry Saxer, Jones & Laughlin Steel Corporation, Woodlawn, Pa., and H. M. Crossett, Bethlehem Steel Co., Johnstown, Pa.

Gage Steel Committee's Work Discontinued

At the February, 1927, meeting of the gage steel committee at Washington, it was pointed out that continuation of the work of the committee at the Bureau of Standards was dependent upon financial support from interested industries. The necessary assistance was not procured and therefore the work was discontinued July 1.

A final report of the laboratory wear tests was contained in a paper on "Recent Experiments Relating to the Wear of Plug Gages" by H. J. French, senior metallurgist and H. K. Herschman, assistant scientist, Bureau of Standards, Washington, at the annual convention of the American Society for Steel Treating, held in Detroit, Sept. 19 to 23.

Mechanical Engineers to Hold Iron and Steel Meeting

The newly formed Iron and Steel Division of the American Society of Mechanical Engineers was authorized at the society's meeting in White Sulphur Springs last May. Roy C. Brett, organizing chairman of the division and chairman of the Cleveland section which sponsored its formation, has called the first national meeting, to be held in Youngstown, Ohio, on Nov. 10. C. Snelling Robinson is chairman of the local committee on arrangements.

Two technical papers will be read in the morning, plant inspection tours will occupy the afternoon, and an informal dinner will be held in the evening. The program will end by 9.15 p. m., to allow visitors to take convenient trains home. The meeting will be in cooperation with various sections of the A. S. M. E. and engineers' clubs in iron and steel localities. An invitation is extended to all engineers and executives of the industry to attend.

C. M. Phelps, Mellon Institute, Pittsburgh, will read a paper on "Super-Refractories." F. C. Biggert, Jr., president United Engineering & Foundry Co., Pittsburgh, will read a paper on "Development of Four-High Rolling Mills." E. T. McCleary, vice-president Youngstown Sheet & Tube Co., will preside. C. S. Robinson, another vice-president of the Youngstown company, will be toastmaster at the dinner, at which the speakers are announced as Charles M. Schwab, James A. Campbell, president of the Youngstown company, and Alex Dow, president Detroit Edison Co. and the president-elect of the A. S. M. E.

Will Heat Coke Ovens with Blast Furnace Gas

The 70 new by-product coke ovens to be built for the Youngstown Sheet & Tube Co., at its South Chicago works, by the Koppers Co., Pittsburgh, will be fired with blast furnace gas. This is another step in the direction of conserving the by-product oven gas and making use of a gas of lower heating values. A by-product coke oven installation in the Lackawanna works of the Bethlehem Steel Co. is equipped with gas producers to fire the ovens.

McClintic-Marshall Co. Acquires Interest in Broderick Steel Frame Corporation

The McClintic-Marshall Co., Pittsburgh, has acquired a large interest in the Broderick Steel Frame Corporation, New York, fabricator of steel frames for small house construction, and the Broderick organization will hereafter be known as the Steel Frame House Co., with main offices in Pittsburgh. The company was founded nearly two years ago by John C. Broderick, who has developed a special steel frame unit system for small houses.

Treasury Order on French Imports Caused Discussion

Much Criticized as Embarrassing State Department in Negotiations Regarding Commercial Treaty

WASHINGTON, Oct. 10.—Much ado has been made about the Treasury order of last week raising tariff duties on certain products when imported from France. Over-sensitive individuals have tried to alarm themselves about the unpleasant international relations which may ensue. The order increasing the duties as they affected particular French imports was sent out as a matter of routine. The mere fact that the State Department is engaged in a rather pointed controversy with France over the Franco-German treaty has nothing to do with the situation. The Treasury order, as it happened, came at the particular time these negotiations of the State Department are under way. The Treasury Department, in its routine, invoked provisions of the Fordney-McCumber act which the department is compelled to put into effect. It would not have done so had France not forced its hand.

What the Tariff Law Requires

Certain paragraphs in the American tariff law provide that, when any country raises duties on the particular commodities covered in those paragraphs, the American duties are automatically fixed at a similar level, provided the duties so established do not exceed 50 per cent ad valorem. Likewise if any country lowers duties on these particular products, the American tariff duties are similarly reduced. If the product is subject otherwise to free entrance into the United States, it is given a duty when coming from any country which has placed a duty on the product, cement being an example. The Treasury Department is kept informed by the Department of Commerce of tariff duties fixed by foreign governments.

When advised of changes affecting the products covered in the paragraphs referred to, the Treasury Department is required to issue orders raising or lowering duties on such products. depending upon the action taken previously by foreign governments on imports of this character coming from the United States. For want of a better term these paragraphs generally are referred to as "countervailing" provisions. By some the term "offset" is used, but this is not satisfactory, nor is the term "retaliatory," because as generally used the latter implies a character of revenge, though in its broader sense it may fit the case, as it is a matter of giving like for like—either increasing or decreasing duties. Assistant Secretary Lowman was quoted as saying:

"The American policy is one of reciprocity. That is our policy. They go up; we go up. They go down; we go down."

The particular paragraphs invoked in the Treasury order, which had the support of Secretary Mellon, reports to the contrary notwithstanding, were 369, 371, 1302, 1563, 1541 and 1543. They cover a rather wide range of products, including automobile parts, headlights, lamps, bicycles, tricycles, motorcycles, accessories and detached parts of velocipedes, wheel rims and bars, tire valves, brakes, lubrication devices, saddle springs, wheels, board in sheets, pulp, vulcanized fiber, solid and hollow bricks, cement and a number of chemical products. When these are imported from France they will now take the same duties France has fixed on them when imported into that country from the United States, all involving increases. At the same time Germany has reduced duties on cycles and certain kinds of cement and as a result will get lower duties on these products when exported to the United States.

The stir made over the Treasury order and the confusion resulting, some purposeful and some merely a matter of misunderstanding, prompted the Treasury Department to issue the following public statement:

> Under the Tariff Act of 1922, several commodities are conditionally free, the condition being that the country of exportation imposes no duty on similar commodities from the United States. An example is Paragraph 1543 with reference to cement. On the dutiable list likewise there are several paragraphs that make the amount of duty dependent upon the rate of duty assessed by the exporting country on similar goods from the United States.
>
> To keep the collectors of customs advised as to the rates of duties assessed on merchandise covered by those paragraphs, the Department of Commerce advises the Treasury Department of all changes in import duties by all foreign countries on commodities covered by the several paragraphs providing for conditional rates. This information in turn is published in the weekly Treasury Decision for the information of customs officers and business interests concerned. The publication of these tariff changes represents no discretionary act on the part of the department. Tariff changes of this character are not uncommon, and Treasury decisions publishing these rates, similar to the one in question, are issued many times during the course of the year and attract little newspaper comment. Furnishing this information to the customs officers is a necessary and more or less routine matter. If the information were not published by the department, the collectors would be compelled to secure the information from other sources, and delays in the liquidation of duties would result.

Plan for World Engineering Congress in Tokio in 1929

A world engineering congress is to be held at Tokio, Japan, for two weeks toward the end of October, 1929. The Kogakkai, the Engineering Society of Japan, is organizing the meeting, which has been sponsored by the Japanese Government with liberal grants of funds.

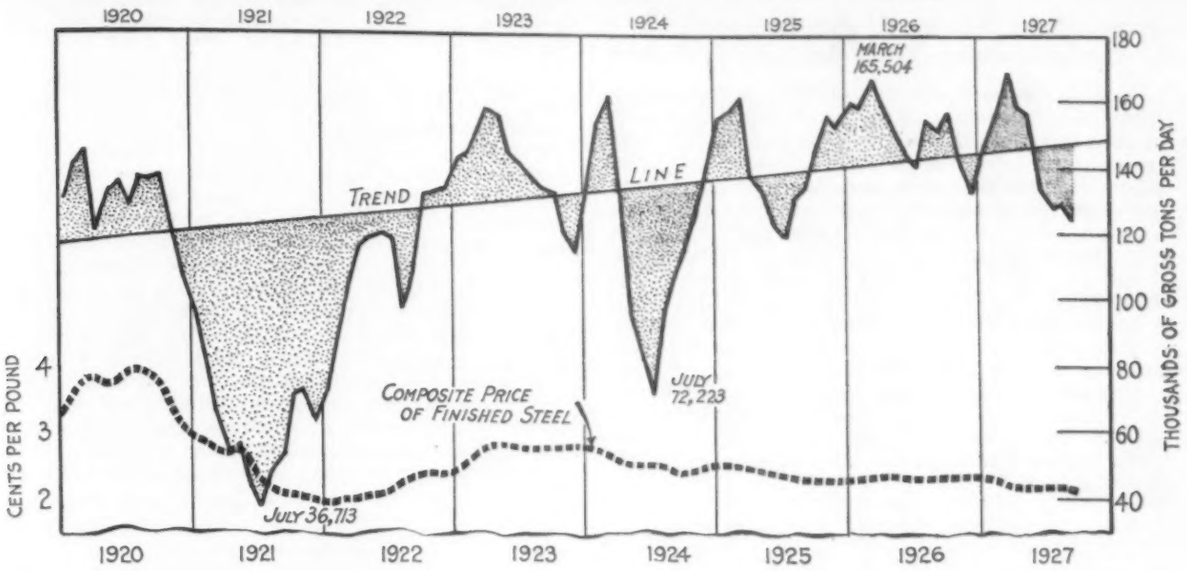
To discuss with engineers in the United States the participation of this country in the congress, Baron Shiba, director of aerodynamic research for the Japanese Government and a member of the Japanese House of Peers, arrived in the United States Oct. 4. He was given a dinner Oct. 7 at the University Club, New York, by Elmer A. Sperry, chairman of the preliminary committee on participation in the congress. A representative gathering of American engineers, including members of the important American engineering societies, welcomed Baron Shiba, and following the formal introduction of the principal guest by Mr. Sperry brief addresses were made by spokesmen of the societies, among whom were J. V. W. Reynders for the mining engineers, L. P. Alford for the mechanical engineers, and Dr. Frank B. Jewett for the electrical engineers. John W. Lieb was toastmaster.

At the congress discussions are to cover engineering as a profession, engineering and scientific education, and engineering and scientific subjects. The congress aims also to promote mutual understanding among engineers throughout the world. The engineering divisions of the United States Government, it is stated, favor active support of the congress.

The Kelly-Decker-Cleary Co., Produce Exchange Building, New York, has been appointed exclusive sales agent in the entire states of New Jersey and Connecticut for the coke of the Domestic Coke Corporation, Fairmont, W. Va., but not in metropolitan New York, as stated in the last issue of THE IRON AGE.

G. C. Davies, Detroit dealer in iron and steel products, formerly located in the Book Building, is now located at 3729 Crane Avenue.

Production of Steel Ingots in September Resumed the Decline Interrupted in August. It is consequently much further below the line representing the trend of consumption



Ingot Output Declines in September

Daily Rate of 124,312 Tons Was 3.3 Per Cent Below August—Nine-Month Total, 5½ Per Cent Under 1926

PRODUCTION of steel ingots in September turned downward after the small increase in August over July had led to the expectation that the fall improvement was beginning. Calculated production of open-hearth and Bessemer steel in September is reported by the American Iron and Steel Institute at 3,232,108 gross tons, comparing with 3,470,903 tons in August. Except for the July figure of 3,178,342 tons, September recorded the smallest output since July, 1925. It compares with 3,913,383 tons in September, 1926. In that month approximately 30,000 tons of crucible and electric steel ingots was included, these being excluded in this year's figures.

With 26 working days in place of 27 last month, production has dropped to 124,312 tons a day, compared with 128,552 tons in August. The daily figure is below that of July which, with only 25 working days, showed 127,134 tons. Here again the figure is the lowest since July, 1925. Both open-hearth and Bessemer steel participated in the decline, the former having dropped nearly 7 per cent and the latter slightly less.

For the nine elapsed months calculated production of open-hearth and Bessemer steel is 33,499,794 tons. About 225,000 tons may be added to cover the electric and crucible ingots omitted from this year's returns. From last year's 35,689,151 tons for the period, the real decline thus amounts to 5.5 per cent. If we estimate production from these small sources at 750 tons a day for September, the daily total would figure out at about 125,000 tons, against 150,515 tons in September of last year. Details of the last 21 months are shown in the table.

Production of Steel Ingots

(Gross Tons)

Months	Reported by Companies Which Made 95.40 Per Cent of the Steel Ingots in 1926		Calculated Production of All Companies	
1927	Open-Hearth	Bessemer	Monthly	Daily
Jan.	3,041,233	545,690	3,759,877*	144,611*
Feb.	3,042,232	565,201	3,781,376*	157,557*
March ..	3,701,418	590,716	4,499,092*	166,633*
April ...	3,340,852	565,634	4,094,849*	157,494*
May	3,272,810	557,683	4,015,192*	154,430*
June ...	2,822,477	486,047	3,468,055*	133,387*
July	2,595,692	436,446	3,178,342*	127,134*
Aug.	2,805,657	505,584	3,470,903*	128,552*
Sept. ...	2,611,976	471,455	3,232,108*	124,312*
9 Months	27,234,347	4,724,456	33,499,794*	143,776*

*Excluding crucible and electric ingots.

1926				
Jan.	3,326,846	581,683	4,132,210	158,931
Feb.	3,023,829	556,031	3,785,051	157,710
March ..	3,590,791	635,680	4,468,617	165,504
April ...	3,282,435	601,037	4,105,799	157,915
May	3,201,230	516,676	3,927,979	151,076
June ...	3,036,162	498,764	3,734,153	143,621
July	2,911,375	526,500	3,634,993	139,807
Aug. ...	3,145,055	627,273	3,986,966	153,345
Sept. ...	3,089,240	612,588	3,913,383	150,515
9 Months	28,606,963	5,156,232	35,689,151	153,172
Oct.	3,224,584	630,526	4,074,544	156,713
Nov.	2,915,558	592,239	3,705,744	142,529
Dec.	2,788,479	493,172	3,466,766	133,337
Total ...	37,535,584	6,872,169	46,936,205	150,920

Lake Ore Movement Declined in September

Lake Superior iron ore shipments from the upper Lake ports in September were 7,230,881 gross tons, or 2,390,875 tons less than the 9,621,756 tons for September last year. This is a decrease of 24.85 per cent. The season's shipments to Oct. 1 were 42,387,376 tons as contrasted with 45,230,908 tons for the same nine months in 1926—decrease of 2,843,532 tons this year or 6.29 per cent. The shipments by ports and for the season in 1927 and in 1926 are as follows in gross tons:

Port	September, 1927	September, 1926	To Oct. 1 1927	To Oct. 1 1926
Escanaba	818,993	1,017,151	4,591,438	4,805,175
Marquette	541,547	503,150	2,502,781	2,557,612
Ashland	878,040	1,153,952	5,237,262	5,724,525
Superior	2,070,811	2,890,403	11,972,174	12,880,261
Duluth	2,072,737	3,050,476	13,294,023	14,360,447
Two Harbors...	848,753	1,006,624	4,789,698	4,902,888
Total	7,230,881	9,621,756	42,387,376	45,230,908
Decrease	2,390,875	.....	2,843,532	.....

Of the season's shipments Duluth's percentage was 31.36 per cent this year as against 31.75 per cent last year. Great Northern's proportion this year was 25.17 per cent; last year it was 25.29 per cent.

DISSATISFACTION IN CARTEL

German Mills Restless Under Continued Fines for Overproduction—Want Separate Syndicates

BERLIN, GERMANY, Sept. 25.—There is still considerable dissatisfaction with the international outlook in the steel business. German mills are increasingly restless under the control of the International Steel Cartel and no acceptable result is expected from the coming cartel meeting in Luxemburg, the purpose of which is to fix production figures for the first quarter of next year. The cartel agreement now binds all members until July 31, 1929. While other members of the cartel, who are exporting heavily, would undoubtedly be willing to accept a reduction in the quota for the next quarter, German mills are opposed, as any reduction would make the German overproduction as a result of home market activity, even larger. The following comparison in metric tons of quotas and actual production of members during the first nine months of this year serves to show where German mills stand in the cartel output of steel:

	Quotas, 9 Months	Output, 9 Months
Germany	9,321,000	11,689,000
France	6,732,000	6,267,000
Belgium	2,495,000	2,778,000
Luxemburg	1,793,000	1,797,000
Saar	1,248,000	1,402,000
Total	21,589,000	23,933,000

While the total overproduction of the entire cartel was 2,344,000 metric tons, with a certain underproduction by France, German excess of output over quotas was 2,368,000 metric tons.

It is admitted by German mills that return to competition of British mills with the termination of the British coal strike was certain to cause some decline in export prices, but they point out that French mills have been receiving the cartel payment for underproduction which has aided them in maintaining unprofitably low prices quoted, so as to maintain a large enough production to justify a later claim for an increased quota.

There is a considerable demand for the creation of separate selling agencies, subordinate to the cartel, which could control prices quoted for export. Germany, with the exception of light gage sheets, has such syndicates, but no such organizations exist in France or Belgium and there is apparently but little progress being made toward their formation.

BELGIAN MARKET DEPRESSED

Belgian Consumers Buy British Iron—French and German Steel Competition Encountered

ANTWERP, BELGIUM, Sept. 24.—The quietness of the market causes a steady tendency toward weakness of prices, quotations varying according to the position of the mills and the severity of foreign competition. French mills are seeking business particularly for beams and have offered considerable concessions to secure orders.

Pig Iron.—Domestic demand continues good but export sales are far from satisfactory. The domestic price on No. 3 phosphoric foundry iron is apparently to be maintained for October and export quotations are generally about £3 ($14.58) per ton, f.o.b. Antwerp, which is too high to compete with the British offers of Middlesbrough iron. In fact, there have been some small tonnages of British pig iron imported by consumers in the North. At the British quotation on Middlesbrough of £3 10s. to £3 12s. ($17 to $17.48) per ton, c.i.f. Belgian port, British iron is cheaper for northern foundries than either the domestic or Luxemburg product. Bessemer hematite iron is quoted in the domestic market at 660 to 670 fr. ($25.87 to $26.86) per ton f.o.b. furnace compared with a British price for East Coast hematite of about 680 fr. ($26.66) per ton, c.i.f. Belgian port. In addition, it is pointed out that the British iron is lower in phosphorus.

Semi-Finished Material.—German competition is strong and the market is developing some weakness in prices with mills in need of tonnage. Blooms, 6-in. and larger, are quoted at £3 18s. ($18.94) per metric ton with 4-in. at £4 1s. ($19.68) per ton. Billets are £4 4s. ($20.41) per ton for 3-in. and £4 6s. ($20.89) per ton for 2-in.

Finished Material.—Buyers continue to show reserve in their purchases, so that with mills, in many instances, approaching the end of their order books, the market is developing considerable weakness. While concessions offered are no larger than in previous weeks they are apparently easily obtained by a determined purchaser. Producers are looking forward to the meeting of the International Steel Cartel and its decision on tonnage quotas. The fact that the European Rail Makers' Association is negotiating for a large tonnage of rails with Argentina leads to the belief that, should Belgian mills receive some of this order, they would be in a more independent position and better able to maintain prices on other steel products. Steel bars for export range from £4 13s. to £4 13s. 6d. per metric ton (1.02c. to 1.03c. per lb.), and beams from £4 10s. to £4 12s. per ton (1.03c. to 1.05c. per lb.). Reinforcing bars are quoted at £5 2s. per ton (1.12c. per lb.) and wire rods at £5 12s. per ton (1.23c. per lb.), all f.o.b. Antwerp.

GERMAN MARKET STILL ACTIVE

Export Prices Again Reduced—Ore Producers Urge Continuation of Subsidy

BERLIN, GERMANY, Sept. 25.—The iron ore and scrap markets are quiet with large stocks in the hands of consumers. The state subsidies granted in June, 1926, when the Siegerland, Lahn and Dill iron ore mines were suffering from depression, expire Sept. 30 and there is strong agitation for their renewal.

The pig iron market is moderately active, but competition from foreign producers, particularly British furnaces, is increasing. The Pig Iron Syndicate, which reduced No. 3 foundry last month, has decreased prices by 3m. to 6m. (72c. to $1.42) per metric ton on all grades of hematite, Siegerland steel making iron and spiegeleisen and fixed the price of foundry grades at 1 m. per ton less than hematite. British competition is given as the reason for this reduction. Internal competition, however, is also a cause, sales by the Roechling interests in South Germany having been under the syndicate schedule and the Maximilianhuette continuing its price-cutting, which began prior to the payment of any British rebates.

As a result of the British rebates to consumers confining their purchases of steel to the domestic product, Continental export prices have been depressed and the German Steel Syndicate in conjunction with domestic manufacturing consumers has determined the "world-market" prices on a lower level. The reductions vary from 1 to 5 m. per metric ton. Steel ingots are quoted at 76 m. ($18.09) per ton, blooms at 81 m. ($19.28), billets are unchanged at 86.50 m. ($20.19) and slabs at 90.50 m. ($21.54).

In the domestic market there is no tendency toward lower prices on manufactured products. The Berlin Founders' Association, for example, has advanced castings prices by about 10 per cent. Steel mills are well booked with business, particularly on semi-finished material. Exports of semi-finished steel, however, are declining slightly. Purchasing of rails and ties is heavy and mills are booked with orders for four to five months. Building construction is declining and orders for structural material are smaller, but there are some large contracts in prospect for elevators, electrical works and steel office buildings. Activity in shipbuilding has decreased but the steel bar market is active and delivery terms of the United Steel Works range from 10 to 15 weeks.

Foreign competition in tubes is keen, but the domestic market shows improvement. German municipalities have entered into an active campaign against the plan for long-distance gas supply from the Ruhr, but the tube industry expects increased purchases of pipe and tubes for this purpose.

European Markets Generally Quiet

British Pig Iron Sales Better—Improvement in Steel Slight—Continental Works in Need of Orders

(*By Cablegram*)

LONDON, ENGLAND, Oct. 10.

CLEVELAND pig iron sales are improving, both domestic and export users covering more extensively. Stocks have been reduced considerably, but still in insufficient amount to warrant relighting of extra foundry or forge furnaces.

Hematite is weaker. Gjers, Mills & Co., Ltd., Middlesbrough, have restarted two blast furnaces on hematite and ferrosilicon.

Foreign ore is quiet. Bilbao exporters are agitating for reduced export duties, being moved thereto by accumulations of stocks.

Domestic demand for finished iron and steel is increasing, but export sales are still negligible. The Northeast Coast shipyards are more active on new orders which provide for use of British steel only. Plate rollers are still in need of orders, but the lighter industries are moderately active. Staffordshire marked bar iron has been reduced 10s. ($2.43) to £13 ($63.18, or 2.82c. a lb.), which is the lowest price since 1914.

Tin plate is somewhat more active, though the demand is still far below normal. But consumers at home and abroad are inclined to show more interest and prices are steady to firm, with makers anxious to raise their level.

Galvanized sheets are inactive as regards India, but other markets are buying small lines. Japan has bought some thick-gage black sheets, but the thin specifications are not active.

On the Continent of Europe

Continental iron and steel markets are generally quiet. Makers are in need of business, but are reluctant to book orders at the current low prices, in view of the possible formation of a European cartel and sales offices for semi-finished and structural steel. British users of semi-finished material are well covered, considering the poor sales of their own products.

The Société Anonyme John Cockerill, Seraing, Liège, Belgium, is to erect an engineering works and shipyard in the Belgian Congo.

French production in August included 774,000 tons of pig iron and 694,000 tons of steel ingots and castings. There were 142 furnaces in blast on Sept. 1.

High Level of Canadian Activity Reported

With the manufacturing situation classified as excellent, a high level of activity prevails in almost every manufacturing industry in the Dominion, according to the monthly letter of the Royal Bank of Canada, Montreal. While the newsprint industry was working at higher percentage of capacity in 1926 than in 1927, the capacity of the industry has been much increased in the past year; production is increasing in Canada, and decreasing in the United States. Electric energy generated has attained new high levels during the year.

On Aug. 1, 1927, the Dominion Bureau of Statistics index number of employment for all industries reached 109.2—a new high level. The index of employment in manufacturing reached 98.9, the highest point since 1920. New high levels have been attained recently in the employment indices for mining, transportation, construction, service and trade. On July 1, 1927, the United States Bureau of Labor Statistics index of employment stood at 89.1. Employment in Canada in August, 1927, was 13.7 per cent above the average of the Augusts in 1921-1925, and employment in the United States was 2 per cent below the average for those years.

It has been estimated that, between 1919 and 1925, the number of wage earners in the United States in manufacturing industries declined 6.7 per cent, while the quantity of manufactured products increased at least 25 per cent. On this basis it is estimated that output per worker increased 34 per cent during that period. It is difficult, if not impossible, to secure similar estimates concerning Canadian industrial production.

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.86 per £ as follows:

Durham coke, del'd.	£0	18s.				$4.37		
Bilbao Rubio ore†	1	1	to £1	1¼s.		5.10	to	$5.16
Cleveland No. 1 fdy.	3	10				17.01*		
Cleveland No. 3 fdy.	3	7½				16.40*		
Cleveland No. 4 fdy.	3	6½				16.16*		
Cleveland No. 4 forge	3	6				16.04*		
Cleveland basic (nom.)	3	15	to	3	15½	18.23	to	18.35
East Coast mixed	3	13	to	3	14	17.74	to	17.98
East Coast hematite	3	13½	to	3	14½	17.86	to	18.10
Rails, 60 lb. and up.	7	15	to	8	0	37.67	to	38.88
Billets	6	0	to	6	10	29.16	to	31.59
Ferromanganese	12	5	to	12	15	59.54	to	61.98
Ferromanganese (export)	11	0	to	11	5	53.46	to	54.68
Sheet and tin plate bars, Welsh	5	7½	to	5	15	26.12	to	27.95
Tin plate, base box	0	18	to	0	18¼	4.37	to	4.43
Black sheets, Japanese specifications.	13	15	to	14	0	66.83	to	68.04
						C. per Lb.		
Ship plates	7	12½	to	8	2½	1.65	to	1.76
Boiler plates	10	10	to	11	0	2.28	to	2.39
Tees	8	2½	to	8	12½	1.76	to	1.87
Channels	7	7½	to	7	17½	1.60	to	1.70
Beams	7	2½	to	7	12½	1.55	to	1.65
Round bars, ¾ to 3 in.	7	12½	to	8	2½	1.65	to	1.76
Steel hoops	10	10	to	11	0	2.28	to	2.39
Black sheets, 24 gage	10	5	to	10	10	2.22	to	2.28
Galv. sheets, 24 gage	13	15	to	14	0	2.98	to	3.03
Cold rolled steel strip, 20 gage, nom.	14	0	to	14	5	3.03	to	3.09

*Export price, 2½s. less for 500 tons or more.
†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron: (a)								
Belgium	£2	18s.	to £3	0s.		$14.08	to	$14.58
France	2	18	to 3	0		14.08	to	14.58
Luxemburg	2	18	to 3	0		14.08	to	14.58
Basic pig iron:								
Belgium	2	17	to 2	17½		13.83	to	13.96
France	2	17	to 2	17½		13.83	to	13.96
Luxemburg	2	17	to 2	17½		13.83	to	13.96
Coke	0	18				4.37		
Billets:								
Belgium	4	3	to 4	5		20.17	to	20.67
France	4	3	to 4	5		20.17	to	20.67
						C. per Lb.		
Merchant bars:								
Belgium	4	12	to 4	13		1.02	to	1.03
France	4	12	to 4	13		1.02	to	1.03
Luxemburg	4	12	to 4	13		1.02	to	1.03
Joists (beams):								
Belgium	4	10	to 4	12		0.99	to	1.02
France	4	10	to 4	12		0.99	to	1.02
Luxemburg	4	10	to 4	12		0.99	to	1.02
Angles:								
Belgium	4	12				1.02		
⅛-in. plates:								
Belgium (a)	6	5	to 6	6		1.38	to	1.39
Germany (a)	6	5	to 6	6		1.38	to	1.39
¼-in. ship plates:								
Belgium	6	1	to 6	2		1.33	to	1.34
Luxemburg	6	1	to 6	2		1.33	to	1.34
Sheets, heavy:								
Belgium	6	1				1.33		
Germany	6	1				1.33		

(a) Nominal.

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"National Metal Week"

OVER 3100 strong, the members of four important societies who gathered at Detroit, Sept. 19-23, probably made up the largest assemblage of American technical men on record. Steel and iron, non-ferrous, automotive and welding industries were all represented, and with the exposition at Detroit housing every form of equipment used in heat treatment, besides many machine tools, while at Cleveland a $1,000,000 collection of the master tools of industry brought thousands to the first show of the National Machine Tool Builders Association, two great centers of the Central West were quite given over to the celebration of "National Metal Week."

Nine years ago the man at the fire—the practical steel treater—was the moving spirit as the American Society for Steel Treating came into existence. Meanwhile technical men in large numbers have lent a hand and become an overshadowing influence, and today the man at the fire and the metallurgist are working hand in hand for the advancement of an old art on modern lines and for its application to new fields.

The story of a great exposition week, as told in THE IRON AGE of Sept. 29, is also the story of a movement that will quicken the pace of all metalworking industries and that rightly guided will win for itself a place of the largest influence.

This Issue in Brief

Finds economy in high-priced labor. Only highly skilled mechanics, able to operate all standard kinds of machine tools, are hired by machinery builder. These men confer with foremen and higher executives on the handling of each job.—Page 1004.

Your foreman-training program will fail unless you back it wholeheartedly. Problems involving company policies will come up for discussion at the group meetings. Therefore, when you embark on a training course, resolve first to place full confidence in it. — Page 1012.

America faces an unemployment problem unless new inventions to absorb workers are forthcoming, Secretary of Labor believes. Labor-saving machinery is displacing workers faster than new industries are developing.—Page 1014.

Cuts labor cost 80 per cent by new handling system. Whereas 4 men formerly took 4 hr. to load a 50-ton car of sheet steel, 3 men now do the work in 1 hr. by the use of midget lift trucks. The steel is divided into piles less than a foot high, placed crosswise on stringers of 4 x 4 in. lumber, laid lengthwise of the car. Wedges take up the slack in transit.—Page 1016.

Old type of foundryman is steadily being supplanted by technically trained new men, who have made the foundry business their profession. Nothing the foundry industry can do to answer the problems confronting it will be nearly so productive as the training of young men of high character, says training supervisor. — Page 1007.

Heat-treatment of cast iron has no other usefulness than to soften the metal. Therefore, it is not necessary to adopt arbitrary temperatures, is consensus of opinion at the Paris foundry convention. — Page 1007.

Former foreign buyers are now making their own steel. The export market is steadily becoming more restricted, due to the spread of the "make it at home" urge.—Page 1008.

Keep the higher executives out of the foreman-training and employee-training classes. Their admission has been found to discourage free discussion, which prevents the full benefits of the training from being realized.—Page 1012.

Instead of passing the work from department to department the same workmen move along with it, in machinery plant. This manufacturer has found that the best results are obtained by assigning certain men to each job, to stay with it from the start until it is ready for delivery to customer.—Page 1003.

Deep pickling vat allows 12 hot-water boilers to be immersed vertically at one time. After pickling, the boilers are dried by waste gases from the galvanizing pot. To insure a perfect interior coating, they are completely filled with zinc, when lowered into the flux.—Page 1017.

Gages of file-soft gage steels resist wear better than file-hard steels. Bureau of Standards conducts tests by device constructed to simulate wear on go, no go and plug gages in actual use. Chromium-plated gages are found to have highest wear-resistance.—Page 1024.

Fear of poorer times ahead is not warranted by economic factors. The causes that have contributed to past periods of depression are not present. Profits have not been high; commodity prices have been falling instead of rising; and, though wage rates are high, they are justified by growing efficiency of labor. Trade should be regarded as limited from falling into the old depths just as it has been limited from ascending to the old heights.—Page 1039.

Should we adopt the Canadian measure of making it unlawful to strike without first attempting to settle disputes by arbitration? Ninety-one per cent of the disputes handled under the Disputes act were ended or averted. While prohibition of strikes by legislation is futile, enforced meeting for arbitration might cut our annual strike bill considerably. —Page 1039.

Charges unsintered flue dust into blast furnace. A charge of 20 per cent flue dust produced highly satisfactory results, says speaker at blast furnace men's meeting.—Page 1031.

Cast iron becomes unmachineable when more than 5 per cent nickel is added, and soft again after 18 per cent, British metallurgist reports. But annealing makes most of the alloys machineable. Between 18 and 20 per cent nickel the alloys are non-magnetic.—Page 1018.

Guns will be trained automatically on invisible airplanes by "listening" device. Audio pointer now focuses search lights on aircraft four miles distant. It will be connected to gun mounts.—Page 1021.

Coal strike is virtually ended. Some of the largest producers have dismissed the union and are now on an open shop basis. Iron and steel producers owning mines that are closed are buying coal cheaper than they could mine it.—Page 1038.

"Outlook in general manufacturing activity is for gains," says Dr. Haney. Trustworthy barometers of industry point to a moderate improvement during the remainder of the year. —Page 1027.

Steel scrap prices seem to have passed the low point. Comparison of average prices shows that the bottom was reached in July. Pig iron average price is now lowest since 1916 and finished steel since 1922.—Page 1030.

ESTABLISHED 1855

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End of the Coal Strike

THE strike of the bituminous coal miners, which is now in its seventh month, although at no time has it figured on the front pages of the newspapers and most persons have forgotten that there was such a thing, is now practically ended. Some of the largest producers of bituminous coal in western Pennsylvania and adjacent regions dismissed the union and went upon an open shop basis. The mines that are on that basis are able to produce all the coal needed in that territory.

Some of the smaller mines are still closed, their workers pitifully waiting for something to turn up, which never will. Some mines that are associated with metallurgical works, to which they furnish fuel, are idle, while those industrial companies are getting their supply, including the cost of the railroad haul, more cheaply than they can get it from their own mines. In this region the union of coal miners has practically ceased to function. Obviously, idle miners cannot continue indefinitely to pay union dues.

In Illinois an agreement between operators and miners has just been made whereby the miners ostensibly are to continue to receive the Jacksonville wage of $7.50 a day, which is regarded by them as a victory. In Illinois the situation is peculiar in that State laws practically restrict coal mining to union men, wherefore there is no possibility of open shop operation and will not be until the miners themselves appeal for the abrogation of these restrictive laws.

The Illinois agreement produces a peculiar state of affairs in bituminous coal mining. Much of that industry has now freed itself, but Illinois becomes an economic island wherein a wage scale can be realized only for those places and those times in which competition from outside coal mines may be precluded by transportation charges. There is every reason to expect that the Illinois industries that are depending upon local coal will be strangled or seriously handicapped, while on the other hand Illinois coal miners will be able to enjoy the $7.50 wage for relatively few days of the year.

Reports from the anthracite fields are that conditions there are not very happy in view of various repercussions from the last strike. The anthracite miners at that time were warned that they were risking a permanent loss of some of their markets, and this appears actually to have been their fate, with the result that neither operators nor miners are now able to get the benefit of full-time operation. The best thing that could happen to anthracite mining would be the abolishing of its own restrictive laws and the introduction of the open shop into that field. Never has there been a great industry in the United States wherein the economic destructiveness of labor unions, exhibited at its worst, has been more clear-cut than in coal mining, both anthracite and bituminous.

Advances in the Non-Ferrous Field

SEVERAL things that have been coming on in non-ferrous metallurgy are worthy of mention as representing some of the latest lines of advance in heat treatment.

As was pointed out in a recent issue of THE IRON AGE, the present activity in light aluminum alloys is rather in the development of fabricating processes than of more types of alloys. The latter are already numerous. Two striking achievements in fabrication and design are the production of forged crank cases for modern high-speed aircraft engines and the making of forged aircraft propellers—both of heat-treated aluminum alloys. One of these propellers was the reliance of Colonel Lindbergh and the Spirit of St. Louis as they journeyed to Paris last May.

In cast aluminum alloys heat treatment has reached the commercial stage, with results that are already important. Heat treatment of high-copper alloys, such as aluminum bronzes, has made certain types equal to high-grade steels, as noted in a late article in THE IRON AGE. Refinements in heat treating methods, combined with controls in composition, have now made possible also the hardening of copper.

The developments cited may well be thought of

as only a beginning, and as warranting large expectations for the successful heat treatment of other non-ferrous metals and alloys. It was the invention of permalloy that revolutionized the sending of cablegrams. In like manner some of these new products may further advance television and kindred marvels of today.

For the Second Thought on Strikes

ADVOCATES of legislation to compel the settlement of industrial disputes by arbitration instead of by strikes and lockouts, particularly those disputes which involve transportation, coal mines, public utilities and other industries affecting large communities, will find no encouragement in a report just issued by the Russell Sage Foundation on "Postponing Strikes." The report, based upon a study of the Canadian Industrial Disputes Investigation act by Ben M. Selekman, asserts:

> Prohibition of strikes and lockouts by legislation is a futile means of attempting to avert industrial disturbances. Getting both sides in a labor dispute together for discussion and conciliation, on the other hand, is shown to have been an effective means of governmental intervention in serious industrial controversies.

The Canadian act prohibits the declaration of a strike or lockout in mines, transportation systems or other public utility industries, until a report on the dispute has been made by a board of conciliation and investigation. It is designed to bring into play the sober second thought of the parties to the dispute, also the pressure of public opinion. The Sage report shows that, in 536 disputes handled under the act in the 18 years of its life, 490, or 91 per cent, were ended or averted. But, it is added, during these years there were 425 strikes in which the act was completely ignored, though it is admitted this failure may be attributed more to difficulties inherent in the coal mining industry than to flaws in the Disputes act.

The Canadian experience, says the report, indicates that governmental bodies can obtain the best results in industrial disputes not by threatening arrest, imprisonment or fines, but by intervening in a sympathetic and conciliatory spirit to find the terms on which agreement may be reached.

The fact remains that the Canadian act has its teeth. It provides a penalty of fines ranging from $100 to $1,000 a day for employers and from $10 to $50 a day for employees who declare a lockout or strike in violation of the act. It does not take a cynical mind to realize that in a certain number of these Canadian disputes angry men were restrained from acting on impulse and paralyzing their industry, by the knowledge of costly punishment for yielding to hot inclination. Arbitration was a case of "needs must." Then, quite naturally, the board of conciliation fulfills its function of "peacemakers called on to create a friendly and informal atmosphere which would help to bring about amicable settlement."

Plenty of cases in the United States come to mind where such a law might have prevented suffering on the part of the public, and great money losses to owners and workers. Take the coal strikes. If operators, heads of the union, walking delegates and the men themselves had known that the minute the mines were shut down officers of the law might hale them into court, some chapters of our coal wars would read differently. Great Britain has its new Trades Dispute act, with penalties designed to prevent a recurrence of its great transportation and coal strikes. The number of thinking men who believe the time is ripe for the passage of some such legislation in the United States is constantly increasing.

Trade Stability

TWO delusions used to alternate in the minds of many people—one, in a time of business activity, that the condition would continue indefinitely, and the other, in a time of depression, that that condition would continue indefinitely. In each the reasoning was that the previous activity or depression, as the case might be, was an accident and that times had so changed that a recurrence was impossible.

Recognizing that both these alternating views were erroneous, many men have been feeling of late —feeling rather than thinking—that poorer times are before us. The view would be natural if this period of the past few years could be identified with the past periods when the much described "business cycle" was in operation. The points of dissimilarity outnumber the points of resemblance. Commodity prices have been falling when according to rule they should be rising. Profits of business concerns have not been what would be expected. There has been no speculation in commodities.

A point of similarity is a high rate of labor employment, with good wages and an improved standard of living. That is insufficient to prove general similarity. It ought to be considered the natural and normal condition. The condition is not harmful unless it produces excesses, unjust demands for higher wages and the shirking of work; but of late wages in general have not been rising and workers have been growing more efficient. Whether that is due to greater will to work or to better tools and methods, or to these things in combination, the economic result is the same.

Falling commodity prices, in contrast with experience in the "business booms" of the past, cannot be explained away on the ground that after a great war prices must fall for many years. They could have substantial fluctuations in such a general course. Nor can the smallness of profits be explained away in an effort to paint recent times as being identical with, or at all similar to, past periods of particular activity. It will not suffice to ascribe the difference to competition. Competitive conditions have always existed except when inflation and speculation made the way of the seller easy for a time.

Sound judgment should take neither position. The old causes of great swings in business have not been fully operative of late, and they have not been fully eliminated. The condition lies between. There has been a flattening out of the business curve. Trade should be regarded as limited just as much from descending into the old depths as it has been limited in the past few years from ascending to the old heights.

This study, which is largely a matter of adjusting one's thinking to the new circumstances, may

follow another line. Business depressions in the past have involved chiefly a recovery from excesses. One great excess was overextension, by new construction in manufacturing or in transportation. Time had to be allowed for the country to grow up. The increase in facilities in the past few years has come about not so much by the construction of new units as by increases in efficiency, by the introduction of better machinery and methods, alike in manufacturing and in railroading. Poorer times would not stop this, as they used to stop new construction. They would simply increase the efforts already being made.

The argument bears on the course of general trade and does not have universal application. It does not suggest that business failures will not increase nor that the stock market will stay up.

Battle of the Thinner Products

THE competition so conspicuous lately between wide strip steel and blue annealed sheets represents only an addition, though a considerable one, to the list of overlapping flat steel products. For a long time the market on blue annealed sheets has been threatened, particularly in time of limited demand, by plate mill competition. It is not a new condition also that the smaller bar mills can roll some sizes and gages of steel that come within the strip classification, while on strips from 6 inches to 20 inches in width the plate or skelp mill comes into play. And, to reverse the order, strip makers have often invaded the domain of the small plate and skelp mill. Going a step further, the product of the tin mill up to certain width limitations has been known to upset the market for the product of the regular sheet mill.

In the introduction of the continuous wide strip mill, some manufacturers are setting up competition for certain of their own products, for on that kind of mill can be rolled flat steel in widths from 12 inches to 36 inches and up to No. 16 gage That gage is the dividing line between blue annealed and black sheets, and it is a question whether the tonnage of blue annealed sheets is greater in widths of 36 inches and more or of 36 inches and under. Going as low as 12 inches in width, the new wide strip mill will offer competition to older type mills turning out strips from 12 inches to 20 inches wide. It will not be long before strips up to 48 inches in width will be coming off the continuous strip mills and this product, box annealed, giving serious competition with black sheets.

Lately the situation has reached a stage at which many companies making these products are asking whether they are not confronted with the setting up of an entirely new sales code. Competition between makers of each of these products is and has been for some time severe, because of more than ample facilities for production and the common consumer practice of taking at one time only the tonnage for which there was immediate need. Now comes this more serious competition between types of mills, which compels the producer to take account of trade conditions in fields quite apart from his own. Can it be said that the market for the thinner product is tending toward a grouping of sheets, hoops, bands, strips, plates and skelp, and a list of extras representing the variations in mill costs for width, length, gage, finish, etc.? That would be no cure for excess capacity, but it might be some offset to the strangely weakening effect of emphasizing types of mills rather than quality of product.

Iron Underlies a Complex Life

STRIKINGLY new discoveries and inventions have influenced human affairs so fundamentally that historians frequently regard them as marking a new era. The introduction of the double acting steam engine by James Watt made as many changes in English life as did the Norman Conquest 700 years earlier. It was the forerunner of innumerable machines and applications of scientific principles which have influenced the political economy of the whole nation, as well as the personal life, and even the vocabulary of the individual citizen.

One might say that all nations have been living in the "steam age" for the last 150 years. An observer who fixed his thoughts on other influences would characterize the times differently. Viewing the change from the artisan and apprentice system of manufacture to the present mass production controlled by powerful corporations, he would be inclined to call this a "mechanical age" under a "capitalistic system." Another, who looks upon the migration of people from one country to another, or from one industry to another, as due chiefly to ease in travel, and who is impressed by the development of the motor car and airplane, will be sure this is an age of transportation.

Electrical enthusiasts will point to street cars, telegraph and telephone, radio, lighting and household conveniences and label these hectic times the "electrical age." Those who are busy converting forests into paper, coal tars into dyestuffs and manure into explosives see that we are on the threshold of the chemical age. THE IRON AGE, by its very name, emphasizes the necessity of iron and steel in abundance in order that steam engines or metal-cutting machines or railroads can be built, and of special alloys for aircraft and electrical devices and chemical equipment.

As a matter of fact all applied sciences are so interrelated that it is hard to pick out the real essentials. If steam engines and electrical motors require iron and steel, the metal industry no less needs plenty of power and controlling devices. The iron producers depend upon the railroads and ships to assemble the ore and coke and to distribute the refined metal. The chemical industry probably could get along without stainless steel; the electrical industry might make shift, albeit less economically, without silicon iron and manganese steel; machinery production would slow down but would not stop if there were no more high-speed tools.

One will readily admit that civilization today requires not only ample raw material, but ready dissemination of ideas in the form of printed pages. It demands an emancipated mental life, unafraid to look into the mysteries of nature and to interpret discoveries in the light of reason. Underlying all, however, is the need for iron. The Iron Age dates far back beyond the James Watt steam engine; its progress in the beginning was slow, but it increased

at an accelerated rate. As Taussig puts it in his "Principles of Economics": "Iron is the foundation of the material apparatus of civilization; it means plant, tools, machinery."

CORRESPONDENCE

Question of the Railroad Steel Tie

To the Editor: In M. H. C.'s plea for a "Broad Study of Steel Ties" appearing in the Sept. 1 issue of THE IRON AGE, the author properly stresses the fact that "the continued success of the industry lies in securing for steel the business that belongs to steel"; therefore, M. H. C. will be among the first to appreciate that any attempt to further the substitution of steel for wood as cross-ties can be accomplished successfully only when it is demonstrable that steel ties are an economical and logical support for rails and not merely "a nearly satisfactory substitute" for wood.

A study of the investigations of the Committee on Track of the American Railway Engineering Association, carefully conducted over a number of years, affords convincing data demonstrating that the continued use of wooden cross-ties is not a matter of foolish sentiment for an old established practice. Ties of many designs and materials, including iron and steel in solid sections and in combination with other materials, have been inserted in track under a variety of conditions, and the reasons for their failure are well established. The metal tie has failed to justify itself even where the exploitation of steel ties has been attempted under the most favorable conditions and where the question of the most suitable material for the use intended has not been a primary consideration.

Railroad engineers have not found satisfactory answers to the questions nor solutions to the problems listed in the third paragraph of the article referred to. M. H. C. appreciates that "it is not necessary to tell the railroads their business," but why should questionnaire-harassed engineers be asked a lot of questions, the answers to which are already recorded by them through their engineering associations. If any sales-engineering-research jobs are to be instituted for the exploitation of steel cross-ties, it is hoped that the director general of such a campaign will first of all develop the practical and economical reasons for the use of the material which is the object of substitution. Such a study will acquaint the steel industry with facts which should give pause to proposed substantial expenditures on steel cross-tie business.

Statistics of Wood Tie Replacements

M. H. C. stresses a possible timber shortage as a reason for the use of steel ties. Railroad engineers are not unaware of the necessity of timber conservation and they can rightly claim recognition as practical conservationists. In the United States there are approximately 1100 million cross ties under about 400,000 miles of track.

The average life of untreated ties throughout the country is seven years; therefore, if ties in their natural state only were used, the present requirements for renewals would be about 157 million ties per year. Preservative treatment of wood has so increased its serviceability, however, that annual tie maintenance requirements have been reduced to about 100 million, a saving of approximately 57 million ties, although there still are many untreated ties in service.

Treated ties are now being used at the rate of about 65 million per year, so that the 400 million untreated ones still in track may be expected to be replaced within a comparatively few years, when the average requirements should approximate 50 million treated ties per year, instead of three times that number if untreated ones were used.

That splendid achievement of practical conservation has been made possible by painstaking development of the art of wood preservation, always encouraged and fostered by railroad managers and engineers of vision, whose motive is, to be sure, the conservation of their maintenance funds, as well as of natural resources. The preservative treatment of wood, by increasing the longevity of the so-called "durable" woods and making available for cross-tie use many "non-durable" species, has definitely removed any concern over future supplies of suitable and inexpensive support for track. Any campaign for the replacement of wooden ties by other materials, predicated on the failure of a dependable and economical supply of wood, is doomed to failure.

Cost Item of Wood Ties

Those who make deductions of cost trends from an examination of raw material values only may be led to a conclusion that railroads, which now pay as much as $1.40 for a wooden tie (which at one time could be bought for 75 cents), must obtain a substitute for such high priced wood. The fact of the matter is that the 75-cent tie, which had to be replaced several times during the life of a treated tie, cost more per year of service than the $1.40 tie, to which the cost of preservative treatment is added. In spite of increasing raw material costs, the *annual* cost of wooden ties in service is decreasing through better protection of wood from decay and mechanical wear.

Assuming that metal ties can be made non-corrosive at a reasonable additional cost and that problems of installation, insulation, maintenance of line and gage, shifting or slewing in track and the development of practicable rail fastenings can be solved to the satisfaction of railroad engineers, there still remains a grave doubt that those officials can be convinced that they should give consideration to supplanting a tried and satisfactory tie of treated wood, obtainable in abundant quantities and at a comparatively low cost, with one of metal which admittedly has many undesirable features and which cannot now be produced and sold at a price which will permit it to compete with the low *annual cost per year of service* of treated wood.

As for the future, it is significant that in European countries where "timber famines" have come and gone and where wood is now produced as a crop, as it eventually will be in this country, wooden ties retain their supremacy even where government monopolies in both iron and railroads lend every advantage to the use of metal ties.

GRANT B. SHIPLEY,
President Century Wood Preserving Co.
Pittsburgh

Novel Use of Ferroalloy Briquettes in German Iron Foundry

A novel modification of ordinary gray iron foundry practice is reported from Germany. Instead of melting various grades of pig iron to produce certain types of gray iron castings, a scheme has been developed whereby briquettes of ferromanganese, ferrosilicon and ferrophosphorus are introduced into the charge so that a higher content of manganese, silicon or phosphorus may be obtained without changing the grade of pig iron to accomplish the same results. This scheme is said to be working satisfactorily and to be not only more convenient but cheaper than the purchasing of the various special grades of iron which would otherwise be necessary to produce castings of special composition. It has also obviated the necessity of keeping track of the various grades of pig iron, and it is stated that the product is just as good, if not better than older methods.

Briefs Filed on Fluorspar Duty

WASHINGTON, Oct. 10.—Briefs were filed today with the Tariff Commission in connection with the fluorspar proceeding. Domestic producers of fluorspar are seeking an increase of 50 per cent in the present duty of $5 per net ton, while importers, including Eastern steel makers, are opposing the effort.

Iron and Steel Markets

Steel Bookings Barely Expand

Demand Not Favoring Usual October Increased Activity, But Large Tonnage Year Seen—Sheets Lower— Pig Iron Dull—Scrap Lower

EXPANSION of bookings so far in October is a fraction of what was expected. Consequently, except possibly among producers who usually figure largely in railroad steel, the continued cautious buying will tend to check the bulge in operations which October weather commonly favors.

In view of the virtual absence of forward contracting, bookings have closely represented consumption for some time. The reduction of 47,924 tons in the amount of the Steel Corporation's unfilled orders at the end of last month, in the light of the month's production, is thus indicative of the summer level of current requirements, remembering further that sizable orders for rails for 1928 were included.

Doubts as to increasing demand from the large consuming industries,—railroads, automobiles, oil production and building and construction,—leave dependence on the smaller diversified fields. Agricultural equipment, metal container, mining and general machinery needs continue on the whole to give a good account of themselves. Output of farm implements this year to date is 35 per cent over 1926.

For the last four months, or since May, the steel industry has averaged under a 72 per cent operating rate. September ingot output, which fell off 3.3 per cent from August, showed the lowest rate of activity in 26 months. However, the nine months of the year produced within 5½ per cent of the amount for the same period of 1926, and all of 1925 was only 6 per cent under the 47,000,000-ton record of 1926.

That there remains the promise of a close matching of 1927 with 1925, the second best year in tonnage, is indicated by the fact that the 33,725,000 tons of ingots already made this year is 1,350,000 tons in excess of the showing for the corresponding period of 1925, and there is this margin to balance against the uncertain prospects for much expansion over the rest of 1927.

Matters of price, hitherto of minor importance, appear now to hold up immediate buying in some centers. In the effort to improve rolling schedules, producers here and there have been seeking a trading level. What, on the other hand, has served to hold prices are the average small size and mixed character of the orders.

Sheet prices, save special finishes, such as metal furniture sheets, are $2 a ton down from last week, following the cut of this amount made in automobile body sheets and in the blue annealed product.

A drop of $2 a ton has been established in tie plates in a period of active rail and track fastening inquiries.

In wire nails the $2.55 price is still being resisted, in the face of deliveries over the last three months commonly at $2.50.

Slack demand for pig iron reflects a curtailment of melt. The carry-over of considerable third quarter iron will reduce further purchases this year. Foundries in the automotive field are not taking all the iron called for in the monthly quotas of their contracts. Malleable plants at Chicago are operating at a very low rate, and steel foundries in the Pittsburgh district compare the dullness to that of the depression of six years ago.

On the encouraging side are increased contract specifications by St. Louis district stove and domestic furnace manufacturers, which have more than offset reduced shipping orders from other melters in that section. In New England increased cotton mill operations are expected to result in a heavier demand for textile machinery castings. Pig iron prices remain largely untested.

Heavy melting steel has declined 25c. a ton at Cleveland, Chicago and St. Louis. The absence of fresh consumer buying and the suspension of shipments against contracts have reduced demand more rapidly than the production of scrap has declined.

Coke is weak and prices on certain grades of coal have undergone further declines. With the resumption of union mining in the Central West, coal production is rising. The gain comes at a time when industrial demand is light and Lake shipments have been practically completed.

The Santa Fe has covered for 121,300 tons of rails, about 70 per cent of the order going to the Colorado mill, 14 per cent each to the Illinois and Inland companies and 2 per cent to the Bethlehem Steel Co. The Union Pacific inquiry is for 40,000 tons. Some 15,000 tons of track accessories will probably be bought in Chicago by the end of the week.

Fabricated structural orders, none for more than 2500 tons, brought the bookings for the week to 32,000 tons. Likewise there were few large projects among the 29,400 tons of fresh inquiries.

Concrete reinforcing bar lettings were swelled to 12,800 tons by a sewer project at St. Louis, which took 7700 tons of bars.

Receipts of iron ore at Lake Erie ports for the season to Oct. 1 were 29,800,000 tons, or about 7 per cent less than for the season last year.

THE IRON AGE composite price for finished steel has reached the low point of the past five years, dropping to 2.331c. a lb. from 2.346c. of the three preceding weeks. One year ago it was 2.453c. The pig iron composite remains for a third week at $18.09 a ton.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Oct. 10, 1927	Oct. 4, 1927	Sept. 13, 1927	Oct. 11, 1926
No. 2, fdy., Philadelphia	$20.26	$20.26	$20.26	$21.76
No. 2 Valley furnace	17.50	17.50	17.50	18.50
No. 2, Southern, Cin'ti	20.94	20.94	20.94	23.69
No. 2, Birmingham	17.25	17.25	17.25	20.00
No. 2 foundry, Chicago*	19.50	19.50	19.50	21.00
Basic, del'd eastern Pa	20.00	20.00	20.00	20.50
Basic, Valley furnace	17.00	17.00	17.00	18.00
Valley Bessemer, del. P'gh	19.76	19.76	19.76	20.76
Malleable, Chicago*	19.50	19.50	19.50	21.00
Malleable, Valley	17.50	17.50	17.50	18.50
Gray forge, Pittsburgh	18.76	18.76	18.76	19.76
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	90.00	90.00	90.00	88.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh	33.00	33.00	33.00	35.00
O.-h. billets, Pittsburgh	33.00	33.00	33.00	35.00
O.-h. sheet bars, P'gh	34.00	34.00	34.00	36.00
Forging billets, P'gh	*38.00*	39.00	39.00	40.00
O.-h. billets, Phila	38.30	38.30	38.30	40.30
Wire rods, Pittsburgh	43.00	43.00	43.00	45.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.75	1.75	1.80	1.90
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.07	2.07	2.12	2.22
Iron bars, Chicago	1.90	1.90	2.00	2.00
Steel bars, Pittsburgh	1.75	1.75	1.80	2.00
Steel bars, Chicago	1.85	1.85	1.90	2.10
Steel bars, New York	2.09	2.09	2.14	2.34
Tank plates, Pittsburgh	1.75	1.75	1.80	1.90
Tank plates, Chicago	1.85	1.85	1.90	2.10
Tank plates, New York	2.09	2.09	2.04	2.24
Beams, Pittsburgh	1.75	1.75	1.80	2.00
Beams, Chicago	1.85	1.85	1.90	2.10
Beams, New York	2.09	2.09	1.95	2.34
Steel hoops, Pittsburgh	2.30	2.30	2.30	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Oct. 10, 1927	Oct. 4, 1927	Sept. 13, 1927	Oct. 11, 1926
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	*2.90*	3.00	3.00	3.00
Sheets, black, No. 24, Chicago dist. mill	3.10	3.10	3.10	3.20
Sheets, galv., No. 24, P'gh	*3.75*	3.85	3.85	3.85
Sheets, galv. No. 24, Chicago dist. mill	3.95	3.95	3.95	4.05
Sheets, blue, 9 & 10, P'gh	2.15	2.15	2.25	2.30
Sheets, blue, 9 & 10, Chicago dist. mill	2.35	2.35	2.35	2.50
Wire nails, Pittsburgh	2.55	2.55	2.55	2.65
Wire nails, Chicago dist. mill	2.60	2.60	2.60	2.70
Plain wire, Pittsburgh	2.40	2.40	2.40	2.50
Plain wire, Chicago dist. mill	2.45	2.45	2.45	2.55
Barbed wire, galv., P'gh	3.25	3.25	3.25	3.35
Barbed wire, galv., Chicago dist. mill	3.30	3.30	3.30	3.40
Tin plate, 100 lb. box, P'gh	$5.50	$5.50	$5.50	$5.50
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	$15.00	$15.00	$15.50	$17.00
Heavy melting steel, Phila.	14.00	14.00	14.00	16.50
Heavy melting steel, Ch'go	*11.75*	12.00	12.25	13.00
Carwheels, Chicago	*13.50*	13.75	14.50	14.50
Carwheels, Phi'adelphia	15.50	15.50	15.50	17.00
No. 1 cast, Pittsburgh	14.75	14.75	15.00	16.00
No. 1 cast, Philadelphia	16.50	16.50	16.50	17.50
No. 1 cast, Ch'go (net ton)	14.50	14.50	14.50	16.50
No. 1 RR. wrot. Phila.	15.50	15.50	15.50	17.00
No. 1 RR. whot. Ch'go (net)	*10.25*	10.50	11.25	12.75
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.85	$2.85	$2.85	$3.50
Foundry coke, prompt	4.00	4.00	4.00	4.50
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	13.25	13.25	13.25	14.25
Electrolytic copper, refinery	*12.95*	13.00	13.00	13.87½
Zinc, St. Louis	**6.07½**	6.00	6.25	7.32½
Zinc, New York	**6.42½**	6.35	6.60	7.67½
Lead, St. Louis	6.00	6.00	6.00	8.20
Lead, New York	6.25	6.25	6.25	8.50
Tin (Straits), New York	*58.50*	59.50	62.00	70.50
Antimony (Asiatic), N. Y.	**11.50**	11.00	11.50	14.75

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

General Reduction of Sheet Prices—Fuel Prices Weaker

PITTSBURGH, Oct. 10.—The steel market shows no increase in activity either as to demand or plant engagement, but any other condition would be somewhat unusual, seeing that in addition to the lessened requirements of the important consuming industries as compared with the early part of the year, there is the restrictive factor of price weakness. All sheet manufacturers have reduced prices on the various finishes by $2 a ton, the reduction also applying to tin mill black plate. Mills in this locality are still finding it hard to get more than 1.75c., base Pittsburgh, for plates, shapes and bars, unless the order is undesirable from a rolling mill viewpoint. Buyers of wire products appear disinterested in fresh supplies, and prices are preserved chiefly because makers are not forcing the issue. Preferential price treatment on tin plate extends to a good many more buyers than was true around the middle of the year, since, with lower pig tin prices, there is as much justification for making a concession on tin plate as to market the black plates in competition with black sheets.

Here and there are cases of an additional open-hearth furnace going into production, but in most instances the resumption is caused by the fact that a little additional production is necessary to maintain reserve supplies rather than because of a gain in the consumptive demand. Pittsburgh proper is producing ingots at the rate of approximately 60 per cent of capacity, but in the adjacent districts the engagement is much lower, and for the entire Greater Pittsburgh area output does not exceed 55 per cent. Greater interest in the market lately on the part of motor car builders is slow in filtering through to productive channels. The cut in sheet prices does not appear to have produced many real orders from that industry, and generally contracts that have been placed are for requirements with no definite word as to the tonnages that will be wanted and when they will be called for. Nearly all recent declines in prices have resulted from an effort by producers to find a trading level rather than from an indicated willingness on the part of consumers to buy at lower prices.

The trend of consumption is down rather than up. This is usually true in the final quarter, when outdoor activities begin to taper and when a large measure of attention is paid to keeping inventories at a minimum for the year-end statements. The steel industry finds adjustment to this situation difficult, because productive capacity is not only so large, but represents such a heavy investment that anything short of 75 per cent operations is extremely costly.

The question continues to be asked as to whether there is a pig iron market here, since there is so little business. Scrap prices are holding fairly well, but that is because of a marked shrinkage in the output and the difficulty that dealers have in buying against sales, and not because of any considerable consumer interest. Coal production is rising, having crossed 10,000,000 tons last week, as a result of the resumption in the Central West. Coming at a time when the Lake shipments are fairly well completed and industrial demand is slack, prices are even weaker than they have been, and signs point to wage reductions in

western Pennsylvania to enable the operators to cope with the situation created by the larger production in Illinois, Indiana and the Southwest. Coke also is weak.

Pig Iron.—Interest is centered on the inquiry of the Westinghouse Electric & Mfg. Co. put out three weeks ago for the fourth quarter requirements of its Trafford, Pa., foundry, because there is nothing else in sight in the shape of a sizable tonnage. No definite tonnage was given in this inquiry, but it is believed that when the purchase is made it will amount to about 1000 tons. Delay in placing the order seems to be due to expectations that the need for business will lead some producer to go under the present price. So far, producers have stood firmly at $17.50, Valley furnace, for No. 2 grade, largely on the ground that at that price they have gone as low as costs will warrant. Single carloads are moving at that price, and such business as is being done in Bessemer iron also runs largely to single carloads. A Pittsburgh district steel maker might buy a round tonnage of basic iron at 50c. a ton under the present price, but there are no producers yet willing to go that low. The melt of iron in this district is moderate, particularly on the part of the steel foundries, which have not gone through such dull times since the depression of six years ago.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$17.00
Bessemer	18.00
Gray forge	17.00
No. 2 foundry	17.50
No. 3 foundry	17.00
Malleable	17.50
Low phosphorus, copper free	27.50

Freight rate to the Pittsburgh or Cleveland districts, $1.76.

Ferroalloys.—One British maker of ferromanganese has made an advance of $5 a ton, but the cabled advices are indefinite as to whether the advance is immediately effective or is to apply on 1928 tonnages. The action is interpreted in various ways, but generally is regarded more as a gesture than a positive move. Domestic producers believe the price should be advanced to $100, since they are losing money, they say, at the present price and would not show much of a margin on the right side even at $95. Meanwhile, consumers are no freer with their specifications on existing contracts, and fresh demands are very light. Producers of the other commonly used ferroalloys also are finding it hard to get buyers to specify, and the fact that the supply of spiegeleisen exceeds the outlet is responsible for some weakness in that material.

Semi-Finished Steel.—It is doubtful if makers in recent years have experienced a more lifeless demand. Formal quarterly contracting has not been common in the past year, and entering the fourth quarter producers merely have oral requirement understandings as a basis for output. The demand for sheets, tin plate and strips is not heavy enough to mean large consumption of sheet bars and billets. With operations curtailed in the automotive industry, the forging companies lack enough business to be large buyers of forging quality steel, and prices are barely steady. Light demand for pipe cuts into the call for skelp. Users of wire rods still appear to be working on supplies bought at under the present price, and that price is yet to be seriously tested.

Wire Products.—Jobbers and consumers do not appear to have exhausted tonnages contracted for prior to the establishment of present prices, and on nails and the other wire products that follow in price the changes in nails, quotations remain purely nominal. Sellers and buyers are jockeying for position, and the outcome will determine whether nails shall go to $2.55, base per keg, Pittsburgh, or remain at $2.50, the common billing price of the past three months. Generally business is light.

Rails and Track Supplies.—The price of tie plates has been established at 2.25c. by the bids made against the Pennsylvania Railroad inquiry, a drop of $2 a ton, but prices of other track accessories appear to have withstood the test of fair-sized inquiries. Generally business in track supplies leaves much to be desired in volume, and activity in standard-section rails is mostly in 1928 requirements, which means mill engagement late in the year rather than in the next 30 or 45 days. Light rails are in better demand, following mine resumptions in the Middle West, and on billet rails, $36, base Pittsburgh, is firmly maintained.

Tubular Goods.—Fairly good demand continues for buttwelded pipe, but business in lapwelded and seamless goods is quite as dull as it has been at any time recently. The Denver-Amarillo gas pipe line has not yet reached the market, and most makers of the larger sizes are approaching the end of their order books. Activity in boiler tubes and mechanical tubing is limited.

Prices are holding well on buttwelded pipe but are still somewhat uncertain on lapwelded and seamless oil country goods and pipe, which were lowered through the revision of the supplementary discounts.

Hot-Rolled Flats.—There is some irregularity in price, and while there has not been general adoption of the quantity price differentials, makers of a considerable tonnage are following the plan and in a general way, 2.10c., base, for wide, and 2.30c. for narrow, strips now prevail on only the smaller tonnages. Most of the sales are at those prices, but most of the tonnage carries prices $2 to $3 a ton less. There has been an increase in the bookings, but it is chiefly in requirement contracts in which neither the tonnages nor shipping dates are mentioned.

Cold-Rolled Strips.—Prices are holding well at 3.25c., base, for lots of 1 up to 3 tons, and business is maintaining its recently improved rate.

Bars, Plates and Shapes.—No appreciable quickening in demand is noted, and the need for orders in plates and bars is still too great for makers to be rigid in their insistence on the small-lot price premium. While 1.80c., base Pittsburgh, is being paid occasionally for small lots of bars and shapes, 1.75c. is the more common price and on plates that is the ruling price for small tonnages. Structural shops report a fairly good inquiry but are finding incoming business lighter than completed orders.

Sheets.—All makers since a week ago have reduced prices $2 per ton, the cut including all finishes except some of the special finishes such as metal furniture

The Iron Age Composite Prices

Finished Steel

Oct. 10, 1927, 2.331c. a Lb.

One week ago	2.346c.
One month ago	2.367c.
One year ago	2.453c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 86 per cent of the United States output of finished steel.

	High		Low	
1927	2.453c.,	Jan. 4;	2.331c.,	Oct. 10
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	Apr. 24;	2.446c.,	Jan. 2

Pig Iron

Oct. 10, 1927, $18.09 a Gross Ton

One week ago	$18.09
One month ago	18.00
One year ago	19.71
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1927	$19.71,	Jan. 4;	$18.00,	Sept. 13
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July [illegible]
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	Mar. 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills	1.75c. to 1.85c.
F.o.b. Chicago	1.85c.
Del'd Philadelphia	2.07c. to 2.17c.
Del'd New York	2.09c. to 2.19c.
Del'd Cleveland	1.94c.
F.o.b. Cleveland	1.75c.
F.o.b. Birmingham	1.95c. to 2.05c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	1.75c. to 1.85c.
F.o.b. Birmingham	1.95c. to 2.05c.

Rail Steel

F.o.b. mill	1.65c. to 1.75c.
F.o.b. Chicago	1.85c.

Iron

Common iron, f.o.b. Chicago	1.90c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.07c. to 2.12c.
Common iron, del'd New York	2.09c. to 2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mills	1.75c. to 1.85c.
F.o.b. Chicago	1.85c.
F.o.b. Birmingham	1.90c. to 2.00c.
Del'd Cleveland	1.94c.
Del'd Philadelphia	2.07c. to 2.12c.
Del'd New York	2.09c. to 2.14c.
C.i.f. Pacific ports	2.30c. to 2.40c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.75c. to 1.85c.
F.o.b. Chicago	1.85c.
F.o.b. Birmingham	1.90c. to 2.00c.
Del'd Cleveland	1.94c.
Del'd Philadelphia	2.07c. to 2.17c.
Del'd New York	2.09c. to 2.19c.
C.i.f. Pacific ports	2.35c. to 2.40c.

Hot-Rolled Flats (Hoops, Bands and Strips)

Base Per Lb.

All gages, narrower than 6 in., P'gh, 2.15c. to 2.30c.

All gages, 6 in. to 12 in., P'gh....1.95c. to 2.10c.

Nos. 13 and 14 gage, 12 in. to 14 in., P'gh, net .....2.30c.

Nos. 15 and 16 gage, 12 in. to 14 in., P'gh, net .....2.40c.

All gages, narrower than 6 in., Chicago, 2.40c. to 2.50c.

All gages, 6 in. and wider, Chicago, 2.20c. to 2.50c.

Cotton ties, per bundle 45-lb. out of stock, f.o.b. Atlantic ports $1.21

Cotton ties, per bundle 45-lb. out of stock, f.o.b. Gulf ports $1.20

*Mills follow plate or sheet prices according to gage on wider than 14 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.10c. to 2.20c.
Bars, f.o.b. Chicago	2.10c. to 2.20c.
Bars, Cleveland	2.25c.
Shafting, ground, f.o.b. mill	*2.45c. to 2.90c.
Strips, under 12 in., 1 up to 3 tons, P'gh	3.25c.
Strips, under 12 in., 1 up to 3 tons, Cleveland	3.25c.
Strips, under 12 in., 1 up to 3 tons, del'd Chicago	3.55c.
Strips, under 12 in., 1 up to 3 tons, Worcester	3.40c.
Stripsheets, 12 in. and wider, Pittsburgh mill	3.00c.
Stripsheets, 12 in. and wider, Cleveland mill	3.00c.
Stripsheets, 12 in. and wider, del'd Chicago	3.30c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.55
Galvanized nails	4.55
Galvanized staples	3.25
Polished staples	3.00
Cement coated nails	2.55

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.40
Annealed fence wire	2.55
Spring wire	3.40
Galv'd wire, No. 9	3.00
Barbed wire, galv'd	3.25
Barbed wire, painted	3.00

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

Base to Retailers Per Net Ton

F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb
Nos. 9 and 10, f.o.b. Pittsburgh	2.15c. to 2.25c.
Nos. 9 and 10, f.o.b. Chicago dist. mill	2.35c.
Nos. 9 and 10, del'd Philadelphia	2.47c. to 2.57c.
Nos. 9 and 10, f.o.b. Birmingham	2.40c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.90c. to 3.00c.
No. 24, f.o.b. Ch'go dist. mill	3.10c.
No. 24, del'd Philadelphia	3.22c. to 3.32c.
No. 24, f.o.b. Birmingham	3.15c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	4.15c.
No. 24, f.o.b. Pittsburgh, B grade	3.95c.

Galvanized

No. 24 f.o.b. Pittsburgh	3.75c. to 3.85c.
No. 24, f.o.b. Chicago dist. mill	3.95c.
No. 24, del'd Philadelphia	4.07c. to 4.17c.
No 24, f.o.b. Birmingham	4.00c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	3.00c. to 3.10c.
No. 28, f.o.b. Chicago dist. mill	3.20c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.15c.

Long Ternes

No. 28, 8-lb. coating, f.o.b. mill	4.20c. to 4.30c.

Tin Plate

Per Base Box

Standard cokes, f.o.b. P'gh district mills	$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per package, 20 x 28 in.)

8-lb. coating I.C.	$11.40
15-lb. coating I.C.	14.45
20-lb. coating I.C.	15.80
25-lb. coating I.C.	$17.30
30-lb. coating I.C.	18.75
40-lb. coating I.C.	20.85

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago or Ohio Mill)

S. A. E. Series Numbers		Base Per 100 Lb.
21.00*	(1½% Nickel, 0.10% to 0.20% Carbon)	$2.90 to $3.00
2300	(3½% Nickel)	4.10 to 4.20
2500	(5% Nickel)	5.00 to 5.25
3100	(Nickel Chromium)	3.10 to 3.20
3200	(Nickel Chromium)	4.75 to 5.00
3300	(Nickel Chromium)	6.75 to 7.00
3400	(Nickel Chromium)	6.00 to 6.25
5100	(Chromium Steel)	3.10 to 3.20
5200*	(Chromium Steel)	7.00 to 7.50
6100	(Chrom. Vanadium bars)	4.10 to 4.30
6100	(Chrom. Vanad. spring steel)	3.60 to 3.80
9250	(Silicon Manganese spring steel)	3.00 to 3.15
	Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
	Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.10 to 4.30
	Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.00 to 4.25
	Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.10 to 3.20
	Chromium Molybdenum spring steel (1 — 1.25 Chrom., 0.30 — 0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base per 100 Lb.
Spikes, ⅝ in. and larger	$2.80
Spikes, ½ in. and smaller	$2.80 to 3.00
Spikes, boat and barge	3.10
Tie plates, steel	2.25
Angle bars	2.75
Track bolts, to steam railroads	3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count,	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	45	32½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	28	12
¾	58	47½	1 to 1½	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	15
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1⅝ to 1⅞ in.	+ 3
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	45	3¼ to 4½ in.	— 9

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
1¼ to 1½ in.	52	3¼ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾ in.	39		

Hot Rolled

2 and 2¼ in.	37	3¼ and 3½ in.	53
2½ and 2¾ in.	45	4 in.	56
3 in.	51	4½, 5 and 6 in.	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

sheets, which still are quoted on a 3c. black sheet base. This is the only basis for a quotation of 3c. for black sheets, since all makers are now quoting that finish at 2.90c., galvanized at 3.75c., tin mill black plate at 2.90c. and automobile body sheets at 4.15c. Blue annealed sheets are going as low as 2.10c. base for the heavy gages, while 2.15c. to 2.20c. now constitutes the range on the lighter gages. The entire market has gone off with automobile body sheets. General business has not been helped by the reduction; rather, buyers have grown more hesitant. A preliminary estimate of the National Association of Sheet and Tin Plate Manufacturers, covering the independent producers, shows that operations in September were 69½ per cent of capacity; sales, approximately 250,000 tons, an increase of 79,000 tons over August; and unfilled orders, 357,000 tons, compared with 312,662 tons at the end of August.

Tin Plate.—Business still drags in tin plate, and the chief basis of mill operations of somewhere between 60 and 65 per cent of capacity is chiefly in production against early 1928 business. It is not hard to find makers willing to concede something in price for early shipment business.

Cold-Finished Steel Bars and Shafting.—Makers in this district still find demand slow, but are having some success in restricting the minimum prices to the large-tonnage buyers.

Bolts, Nuts and Rivets.—Fourth quarter contracting is active enough, but specifications still are low, and actual demand is easily supplied with an engagement of only about 50 per cent of capacity. Prices, however, are firmly maintained.

Coke and Coal.—Considerable pressure is being exerted by blast furnace and foundry interests for lower prices to enable them to produce profitably at present pig iron and castings prices. One large producer of foundry coke has made a reduction of 25c. per ton, now quoting $5.10, and there has been a like recession in the less choice brands, which range from $3.75 to $4.50. It is reported that a fourth quarter contract for furnace coke has been placed at, or close to, $3 per net ton at ovens, which compares with $3.15 on earlier contracts. Spot furnace coke is holding at the recent range, but sales at the top price are fewer than they have been. The spot market in both furnace and foundry coke is limited, and producers are not able to do any better in marketing coal, the supply of which is more than ample for requirements. Slack coal is a drug on the market. The resumption of operations in union mines in the Central West is causing no apprehension that the union will be able to regain a foothold in this part of the country, because the increased production in the Central West cuts off prospective business for Western Pennsylvania and West Virginia mines and makes uncertain the continued operation of many mines in that territory. The problem is in finding places for the men that are available rather than considering a working agreement that has been found uneconomic.

Old Material.—The market is still exceedingly quiet and has a weak undertone, but there is no occasion for further downward revision of prices. There have been no sales into consumption of heavy melting steel at less than $15. It is evident that in spite of the continued suspension of shipments at three points in the district some consumers are open. The steel in the October scrap list of the Pennsylvania Railroad went at approximately $15.10, delivered to a Pittsburgh district mill, and $15.25 was paid for the Pittsburgh & Lake Erie steel, also delivered this district.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:		
Heavy melting steel		$15.00
Scrap rails	$14.00 to	14.50
Compressed sheet steel		14.50
Bundled sheets, sides and ends		13.50
Cast iron carwheels		15.00
Sheet bar crops, ordinary	15.00 to	15.50
Heavy breakable cast	13.75 to	14.00
No. 2 railroad wrought		15.00
Heavy steel axle turnings	13.50 to	14.00
Machine shop turnings	11.50 to	12.00
Acid Open-Hearth Furnace Grades:		
Railroad knuckles and couplers	16.25 to	16.50
Railroad coil and leaf springs	16.25 to	16.50
Rolled steel wheels	16.25 to	16.50
Low phosphorus billet and bloom ends	19.50 to	20.00
Low phosphorus, mill plate	19.00 to	19.50
Low phosphorus, light grade	17.00 to	17.50
Low phosphorus sheet bar crops	18.50 to	19.00
Heavy steel axle turnings	13.50 to	14.00
Electric Furnace Grades:		
Low phosphorus punchings	17.00 to	17.50
Heavy steel axle turnings	13.50 to	14.00
Blast Furnace Grades:		
Short shoveling steel turnings	11.50 to	12.00
Short mixed borings and turnings		11.00
Cast iron borings		11.00
No. 2 busheling	10.00 to	10.50
Rolling Mill Grades:		
Steel car axles	19.00 to	20.00
No. 1 railroad wrought	12.00 to	12.50
Cupola Grades:		
No. 1 cast	14.75 to	15.75
Rails 3 ft. and under	15.50 to	16.00
Malleable Grades:		
Railroad		15.00
Industrial		14.50
Agricultural		14.00

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c. to 3.65c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.75c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.60c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.30c.
Spikes, large	3.30c. to 3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, ¾ in. and smaller, per 100 count,	62½ per cent off list
Machine bolts, per 100 count.	62½ per cent off list
Carriage bolts, per 100 count.	62½ per cent off list
Nuts, all styles, per 100 count,	62½ per cent off list
Large rivets, base per 100 lb	$3.50
Wire, black soft annealed, base per 100 lb.	2.90
Wire, galvanized soft, base per 100 lb.	2.90
Common wire nails, per keg	$2.80 to 2.90
Cement coated nails, per keg	2.85 to 2.95

More Accidents per Man-hour But Less per Unit of Production

"While there has been a recent increase in the hazard of industry per man-hour, production per man-hour has increased so much more rapidly that the hazard in terms of production has decreased," says Albert W. Whitney, general manager National Bureau of Casualty and Surety Underwriters, New York, in a report to the American Engineering Council. "Today a barrel of flour, a pair of shoes, an automobile or a barrel of cement can be made with less loss of life and limb than ever before.

"These two facts together form a striking antithesis: less accidents measured in terms of things produced, more things produced, however, so that the result after all is more accidents. We cannot view with composure a condition that makes a man's working life more hazardous under any circumstances.

"The first years of the safety movement were spent in clearing up the accumulated bad conditions that were the result of years of neglect, and the results were comparatively easy to produce.

"The new safety movement will be very different for it will have to meet not static conditions but the increasingly difficult conditions of an industry that is continuously growing more intense.

"The United States Steel Corporation in fifteen years has decreased its accidents 86 per cent. One of the branches of the du Pont company with 250 employees has a record of seven years with only one accident, and that a minor one.

"It is believed that the success of the safety movement of the future, a movement that must stem an industrial tide that is running not only swiftly and dangerously but ever more swiftly and more dangerously, can be had only when safety is recognized as a major executive objective."

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$33.00
Rerolling, under 4-in. to and including 1¾-in.	$33.50 to 34.00
Forging, ordinary	38.00 to 39.00
Forging, guaranteed	43.00 to 44.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$34.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$33.00
Smaller than 8 in. x 2 in.	34.00

Skelp

	Per Lb.
Grooved	1.75c. to 1.85c.
Sheared	1.75c. to 1.85c.
Universal	1.75c. to 1.85c.

Wire Rods

	Per Gross Ton
*Common soft, base	$43.00
Screw stock	$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is $43 to $44. Cleveland mill base, $42 to $43.

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.50c.
Iron ore, Swedish, average 66% iron	9.75c. to 10.00c.
Manganese ore, washed, 52% manganese, from the Caucasus	39c. to 40c.
Manganese ore, Brazilian, African or Indian, basis 50%	38c. to 39c.
Tungsten ore, high grade, per unit, in 60% concentrates	$10.50 to $10.75
	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00
	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2 delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.85 to $3.00
Foundry, f.o.b. Connellsville prompt	4.00 to 4.50
Foundry, by-product, Ch'go ovens	9.75
Foundry, by-product, New England, del'd	12.00
Foundry, by-product, Newark or Jersey City, delivered	9.46 to 10.77
Foundry, Birmingham	5.50
Foundry, by-product, St. Louis	9.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.50 to $1.90
Mine run coking coal, f.o.b. W. Pa. mines	1.65 to 1.85
Mine run gas coal, f.o.b. Pa. mines	1.85 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.05 to 1.15
Gas slack, f.o.b. W. Pa. mines	1.25 to 1.40

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$90.00
Foreign, 80%, Atlantic or Gulf port, duty paid	90.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $32.00
Domestic, 16 to 19%	30.00 to 31.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$85.00 to $87.50
75%	145.00

Per Gross Ton Furnace		Per Gross Ton Furnace	
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
10%	$34.00	12%	$38.00
11%	36.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
6%	$26.50	10%	$32.00
7%	27.50	11%	34.00
8%	28.50	12%	36.00
9%	30.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	95c. to $1.05
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$16.00 to $16.50
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	———
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagon	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled threads up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages	80, 10 and 5
Stove bolts in bulk	80, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discount of 70 per cent off on bolts and nuts applies on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.75
F.o.b. Chicago	2.85 to 3.10

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10, 10 and 5 to 70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened	80 and 10
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U.S.S. thread	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

Heavy Rail Buying—Two Corporation Furnaces Blown Out

CHICAGO, Oct. 10.—The output of steel mill blast furnaces has been reduced this week by the banking of two Steel Corporation stacks. There are now six active furnaces at Gary, five at South Chicago and one at Joliet, a total of 12 out of 27. Counting all steel works stacks in this district, there are 20 out of 36 now in service. The reduction in pig iron production brings it more in line with ingot output and indicates that larger stocks of iron are not desirable at this time.

In contrast with this development is the announcement by one manufacturer of standard-section rails that releases against 1928 contracts will necessitate an increase in ingot production in the next 10 days from an average of 60 per cent of capacity to not less than 75 per cent.

Conditions in the steel market as a whole show little change. Demand from the automobile trade is noticeably smaller, but the possibility of a more active structural market is encouraging. Producers and users alike are less inclined to speculate on when an expected upturn in the market will come. Competition for going tonnages is keen because mills are striving to improve rolling schedules, which often do not provide for the use of one set of rolls for more than one-fifth of their expected life. The rail market is active, with new inquiry including 40,000 tons for the Union Pacific. Prices of sheets are not stable, weakening influences now having been extended to the galvanized product.

Pig Iron.—The local pig iron market is without life. Fresh inquiry is small, and new buying is confined almost wholly to users' requirements for the current month. Shipments are a shade lighter, now being equal to those of the first part of September. Figures now available show that deliveries for the first nine months of this year were 10 per cent below the total for the corresponding period of 1926. The flurry in the charcoal iron market that resulted from the quick sale of stocks at furnaces at prices below the general market appears to have passed, and sales this week in the Chicago district have been at $27.04, delivered. There is little interest in low phosphorus iron, which is quoted at $30.50 to $31 a gross ton, delivered consumers' yards. The silvery market is without feature. Foundry operations are spotty, the tendency in output being down rather than up. The malleable industry is operating at an unusually low rate. Jobbing foundries are moderately active, but the output in individual plants varies widely from week to week. Iron melt in manufacturing plants is of fair proportions and moderately stable. Merchant iron production is unchanged, and stocks at the furnaces are growing at an increased rate.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	$19.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.00
Malleable, not over 2.25 sil.	19.50
High phosphorus	19.50
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	23.26
Southern No. 2 (barge and rail)	21.43
Low phos., sil. 1 to 2 per cent, copper free	$30.50 to 31.00
Silvery, sil. 8 per cent	33.29
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—Local sellers are quoting $31, Hazzard, Pa., on lots of 100 tons or more of 19 to 21 per cent spiegeleisen. Carload lots are being sold at $32, base, or $39.76, delivered. An English producer of ferromanganese is reported to have tried to obtain $95, seaboard. The advance in price has not held and carload sales have been made this week in Chicago at $90, seaboard. Specifications for ferrosilicon are unusually light for this time of the year.

Prices delivered Chicago: 80 per cent ferromanganese, $97.56; 50 per cent ferrosilicon, $85 to $87.50; spiegeleisen, 18 to 22 per cent, $38.76 to $39.76.

Bolts, Nuts and Rivets.—Specifications are smaller, and the industry as a whole is not engaged at more than 50 per cent of capacity. Requirements of automobile manufacturers are noticeably smaller, and several makers of farm implements who now are taking inventory preparatory to the late fall and winter manufacturing for spring delivery have reduced specifications. Prices of small rivets are lacking in strength.

Plates.—Chicago mills are still forced to look to the oil industry for large tonnages of plates. A Southwestern oil producer has entered an order for 3500 tons of tankage steel. Fresh inquiry now before the trade totals 5000 tons, and projects in the making indicate that the volume of orders will be of fair proportions well into the late fall months. Car building shops are operating at a very low rate, and current railroad equipment inquiries can have little, if any, effect on the rate of plate production. Demand from miscellaneous users remains relatively steady. While it is out of place to speak of backlogs in a market of this kind, it can be said that producers are more comfortably situated as to orders and rolling schedules in sheared plates than in the universal mill product. Mill prices on plates are 1.85c., Chicago, but that quotation is not so steady as current prices on shapes or bars.

Mill prices on plates per lb.: 1.85c., base, Chicago.

Structural Material.—Building permits in Chicago last month were a trifle larger than in September, 1926. Structural awards in the first 10 days of October are well up to normal for this time of the year, but, in contrast with 1926, shops have come into the fall months with unusually small backlogs. Outstanding local awards this week include an open-hearth building for the Wisconsin Steel Works, 2400 tons, and the 106th Street bascule bridge, 1800 tons. Two Chicago projects that have been revived and that now give promise of going forward to completion are the Crawford Avenue bascule bridge, 1700 tons, and a memorial Young Women's Christian Association building, 1100 tons. Mill prices on structural shapes are steady at 1.85c., Chicago, on the general run of business.

Mill prices on plain material per lb.: 1.85c., base Chicago.

Bars.—Demand for mild steel bars from miscellaneous users is steady, but the total of all specifications is smaller as a result of the shrinking requirements of automobile builders and manufacturers of accessories. Orders are at close range and are usually specified for delivery at the earliest convenience of the mills. Mill prices are steady at 1.85c., Chicago. In the absence of business that would test prices, iron bars are being held at 1.90c., Chicago, or $1 a ton above the going prices for soft steel bars. The alloy steel bar market is quiet, and the shipments are slowly declining. Orders for rail steel bars are less numerous and in smaller total volume. Both Chicago Heights mills are operating double turn, but they are not being crowded so hard as earlier in the fall. The bed trade, after two weeks of improved buying, has reverted to dullness, which is not usually expected at this time of the year. Shipments of hard steel bars during the past nine months were a trifle smaller than in the corresponding period of 1926. Rail steel bars are commonly quoted at 1.85c., Chicago.

Mill prices per lb.: Soft steel bars, 1.85c., base, Chicago; common bar iron, 1.90c., base, Chicago; rail steel bars, 1.85c., base, Chicago.

Reinforcing Bars.—Fresh inquiry is showing a marked upturn and some promise is given that the slowing down in bending shop operations, which now stand at 60 per cent of capacity, will be checked. New local projects include a West Side sewer, 1000 tons; the Kelly High School, 400 tons, and several apartment buildings, each requiring close to 300 tons of bars. Buying at the moment is not active except in lots of less than 100 tons each. Prices are not strong, and there is doubt in some quarters that 2.30c. can be held as the minimum on billet steel bars out of Chicago warehouses. The rail steel commodity is fairly steady at 2c., Chicago. Awards and inquiries are shown on page 1062.

Sheets.—Mills are scheduled about one week ahead, and production ranges from 70 to 75 per cent of ca-

pacity. Stripsheet makers are still quoting below the market on narrow blue annealed sheets. Individual orders are small, however, and local sheet producers are trying to hold blue annealed at 2.40c., Chicago. The fact that many orders are for mixed widths is also helping them to maintain prices, inasmuch as many buyers find it an advantage to obtain their full requirements from one source. The jobbing trade is active, but stocks are low and much dependence is being placed on mill deliveries. The demand for roofing sheets is light.

Base prices per lb., delivered from mill in Chicago: No. 24 black, 3.15c.; No. 24 galvanized, 4c.; No. 10 blue annealed, 2.40c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Wire Rods.—This commodity is not active, and prices are settling around $43, base Chicago mill.

Wire Products.—Sales and specifications are unchanged in total volume. The manufacturing trade is slightly less active, but jobbers are taking out larger quantities. Demand is widespread and well balanced throughout most of the country. Stocks held by jobbers are small, necessitating well balanced assortments at the mills. New buying has expanded this fall, but it has not reached the proportions looked for in some quarters. Output at mills is between 55 and 60 per cent of capacity, indicating a more uniform demand over the late summer and early fall months than a year ago. Mill prices for wire and wire products are given on page 1045.

Cold-Rolled Strip.—Prices are steady, and the new differentials are being quoted. Production has tapered to 65 per cent of capacity.

Cast Iron Pipe.—Demand is largely confined to the requirements of contractors. An unusually heavy rainfall in September and so far in October has delayed pipe laying operations. In some parts of Illinois trench work could be carried on only one day out of the past six. Contractors, wishing to avoid controllable delays, have not held back shipments because of these conditions. The price situation is little changed except that $27 to $30, base Birmingham, is more easily obtained on small-tonnage purchases. Several medium-sized orders have been received from public utility companies. Deliveries are reasonably prompt in most sizes from the majority of foundries.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, $34.20 to $37.20; 4-in., $38.20 to $41.20; Class A and gas pipe, $4 extra.

Rails and Track Supplies.—The Santa Fe has purchased 121,300 tons of standard-section rails. The Colorado Fuel & Iron Co. will roll 85,000 tons, the Illinois Steel Co., 17,000 tons, the Inland Steel Co., 17,000 tons, and the Bethlehem Steel Co., 2300 tons. Thirty per cent of the 200,000 tons purchased last week by the Pennsylvania will be delivered from Western mills. A year ago that railroad ordered 160,000 tons and took options on 40,000 tons. These figures are in contrast with the 200,000-ton order and 100,000 tons on option for 1928 requirements. Inquiry now before the trade is for not less than 300,000 tons. Of 30,000 tons of track fastenings now on inquiry, it is probable that orders for 15,000 tons will be taken before the end of the week. Prices for these commodities are lower, quotations now being $2.80 per 100 lb. for large spikes, $2.25 for steel tie plates and $3.80 for track bolts to steam railroads. Light rails are in small demand, and commonly quoted prices are $36 per gross ton, f.o.b. Chicago mill.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, $43; light rails, rolled from billets, $36. *Per Lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.25c.; angle bars, 2.75c.

Hot-Rolled Strip.—Specifications are in smaller volume and there is some unsettling in the prices of narrow widths, which are now 2.40c. to 2.50c., Chicago.

Coke.—Prices of by-product foundry coke are firm at $9.75, local ovens, and $10.25, delivered in the Chicago switching district. A lower rate of iron melt is not yet reflected in shipments of foundry coke. Spot sales are moderately active, and contracting for 1928 will not get under way for three or four weeks.

Old Material.—A large consumer has bought 3000 tons of heavy melting steel at $12.25 per gross ton, delivered, which is 25c. below the market of a week ago. Purchasers continue to press for concessions, and prices are weak for all grades. Old orders, plus a small amount of current business, so far has been able to absorb outcoming shipments, but the margin is close and occasional carloads are difficult to place. Foundries, particularly those making malleable castings, are carrying stocks that they believe to be adequate to meet the requirements of the current run of orders for foundry products. Hence sales of scrap to that trade can be made only at reduced prices. Railroad shipments are large, but manufacturers' scrap is coming out in smaller quantities. Producers are not inclined as a general rule to hold scrap and speculate on a future market. Is it simply a case of lower production. The market is dull in cast iron borings. A producer will sell 1000 tons this week. The best consumer offer is $10.50 per gross ton, delivered.

Prices delivered consumers' yards, Chicago:

Per Gross Ton	
Basic Open-Hearth Grades:	
Heavy melting steel	$11.75 to $12.25
Shoveling steel	11.75 to 12.25
Frogs, switches and guards, cut apart, and miscellaneous rails	13.25 to 13.75
Hydraulic compressed sheets	10.25 to 10.75
Drop forge flashings	9.00 to 9.50
Forged, cast and rolled steel carwheels	15.00 to 15.50
Railroad tires, charging box size	15.00 to 15.50
Railroad leaf springs, cut apart	15.00 to 15.50
Acid Open-Hearth Grades:	
Steel couplers and knuckles	13.50 to 14.00
Coil springs	15.00 to 15.50
Low phosphorus punchings	13.75 to 14.25
Electric Furnace Grades:	
Axle turnings	11.50 to 12.00
Blast Furnace Grades:	
Axle turnings	10.75 to 11.25
Cast iron borings	10.00 to 10.50
Short shoveling turnings	10.00 to 10.50
Machine shop turnings	7.00 to 7.50
Rolling Mill Grades:	
Iron rails	13.00 to 13.50
Rerolling rails	14.50 to 15.00
Cupola Grades:	
Steel rails less than 3 ft	15.00 to 15.50
Angle bars, steel	13.50 to 14.00
Cast iron carwheels	13.50 to 14.00
Malleable Grades:	
Railroad	13.00 to 13.50
Agricultural	12.75 to 13.25
Miscellaneous:	
*Relaying rails, 56 to 60 lb	23.00 to 25.00
*Relaying rails, 65 lb. and heavier	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades:	
Iron angle and splice bars	13.50 to 14.00
Iron arch bars and transoms	18.25 to 18.75
Iron car axles	20.00 to 20.50
Steel car axles	16.75 to 17.25
No. 1 railroad wrought	10.25 to 10.75
No. 2 railroad wrought	10.25 to 10.75
No. 1 busheling	9.00 to 9.50
No. 2 busheling	5.00 to 5.50
Locomotive tires, smooth	13.00 to 13.50
Pipes and flues	7.50 to 8.00
Cupola Grades:	
No. 1 machinery cast	14.50 to 15.00
No. 1 railroad cast	13.50 to 14.00
No. 1 agricultural cast	13.00 to 13.50
Stove plate	12.25 to 12.75
Grate bars	10.75 to 11.25
Brake shoes	10.25 to 10.75

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforcing bars, billet steel	2.30c. to 2.75c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.95c.
Galvanized sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.50c.
Spikes, standard railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, squares, tapped or blank	60
Hot-pressed nuts, hexagons, tapped or blank	60
No. 8 black annealed wire, per 100 lb	$3.20
Common wire nails, base per keg	$2.85 to 2.95
Cement coated nails, base per keg	2.95

New York

Prices of Plates, Shapes and Bars Firmer —Sheets Decline $2 a Ton

NEW YORK, Oct. 10.—In a quiet pig iron market, sales by local brokers totaled only 4000 tons for the week. Inquiries are confined mainly to small lots for mixture purposes, and prospects for a real buying movement in this quarter are not regarded as promising. Some melters are carrying considerable third quarter iron into this quarter, and others covered most of their requirements for the rest of the year some time ago. Meanwhile Buffalo producers have comfortable bookings for the next 60 days and are adhering to a price of $17, base furnace, on foundry iron. While it is possible that this price might be broken on a large inquiry, such inquiries are not forthcoming. Eastern Pennsylvania foundry iron is still available at $19, base furnace, for delivery in this district. Competitive pressure on the part of furnaces east of Buffalo is less in evidence. The Troy, N. Y., furnace will be blown out soon, subsequent to making some No. 1 foundry and high silicon iron, and has sufficient iron piled to take care of its customers until early next year, with the possibility that it may not resume operations until spring. The Port Henry, N. Y., furnace which was blown out some time ago will not be relighted this month, as originally planned, and may not go in until late in November. Foundry melt shows no gain, but improvement in the operations of cotton mills in New England may soon be reflected in increased demand for castings from foundries serving the textile industry. The General Electric Co., Schenectady, N. Y., is in the market for 625 tons of high silicon foundry iron for delivery through the quarter, of which 400 tons is for Everett, Mass., and 225 tons for Lynn, Mass. There have been some small sales of English hematite to American users of low phosphorus metal. That grade is quoted at $23.50 per gross ton, duty paid, port of entry.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25 (all rail)	$21.91
No. 2 plain fdy. (by barge, del'd alongside in lighterage limits N. Y. and Brooklyn)	19.50
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	$20.39 to $21.52
East. Pa. No. 2 fdy., sil. 2.25 to 2.75	20.89 to 22.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	21.39 to 22.52

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

Ferroalloys.—Reports from Pittsburgh and Chicago that one British producer has raised his quotation for ferromanganese from $90 to $95 cannot be vertified in this market. The small amount of business that has been done is reported at $90, seaboard or furnace. A small part of the 300 tons before the market a week ago is reported sold for delivery through Louisiana ports with the remainder still under negotiation. Specifications on contract are reported better this month than in either August or September. Spiegeleisen can be bought at $32 or $33, depending on the quantity and place of delivery, but new business is very light.

Finished Material.—The fairly definite establishment of 1.75c., Pittsburgh, as a minimum on bars, shapes and plates in this market has been offset in the last week by weakness in sheet prices. While shading of $2 a ton on blue annealed sheets had become common enough to establish the market at 2.15c., Pittsburgh, by the beginning of the quarter, similar cutting on black and galvanized sheets had not been common enough to represent the market until this week. However, business placed in the last few days has been almost entirely at 3.75c., and 2.90c., Pittsburgh, on galvanized and black sheets respectively. On hot-rolled strip it is possible to bring out concessions on 2.10c., Pittsburgh or Cleveland, on stock 6 in. and wider, and the narrower widths have been sold at 2.15c. However, 2.20c. is more representative of the market on this product. The absence of particularly attractive tonnages in the structural market during October has given the mills an opportunity to establish the price on shapes at 1.75c., Pittsburgh, and no instances of shading have been reported. Yet very small lots have been taken at this price and the differential on small quantities is nearer $1 than $2 a ton. The same might be said of plates and bars, although 1.85c., Pittsburgh, is still being quoted by some companies on small lots. The pipe market is quiet, with a run of small orders that is less than seasonal. Some rather substantial purchases of track accessories have been made since the first of the month and additional new inquiry gives promise of continued activity in this line. Bookings of fabricated structural steel in the New York metropolitan territory during September, as reported to the Structural Steel Board of Trade, amounted to 26,000 tons exclusive of bridges, subways, etc. This compares with 32,000 tons in the previous month and with 33,000 tons in September, 1926.

Mill prices per lb. delivered New York: Soft steel bars, 2.09c. to 2.19c.; plates, 2.09c. to 2.14c.; structural shapes, 2.09c. to 2.19c.; bar iron, 2.09c. to 2.14c.

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished shafting and screw stock—	
Rounds and hexagons	4.00c.
Flats and squares	4.50c.
Cold-rolled strip, soft and quarter hard,	5.75c. to 6.25c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage)	3.89c.
Long terne sheets (No. 24 gage)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller	55 to 60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	55 to 60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	55 to 60
1 x 16 in. and smaller	50 to 50 and 10

Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
⅛-in. butt	46	29
¼-in. butt	51	37
⅜-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
⅛-in. butt	5	+19
¼-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.95c. to 4.00c.
No. 22	4.10c. to 4.15c.
No. 24	4.15c. to 4.20c.
No. 26	4.25c. to 4.30c.
No. 28*	4.40c. to 4.45c.
No. 30	4.65c. to 4.70c.

Sheets, Galvanized

	Per Lb.
No. 14	4.35c.
No. 16	4.45c.
No. 18	4.55c. to 4.60c.
No. 20	4.70c. to 4.75c.
No. 22	4.75c. to 4.80c.
No. 24	4.90c. to 4.95c.
No. 26	5.15c. to 5.20c.
No. 28*	5.40c. to 5.45c.
No. 30	5.80c. to 5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Cast Iron Pipe.—Municipal inquiries are light, but there is more demand from public utilities and other private buyers. Prices, however, have given further ground and now range from $27 to $28, Birmingham, for 6-in. and larger diameters. The city of New York, which recently took bids on 4250 tons of water pipe, has awarded 2150 tons to the Donaldson Iron Co. and 2100 tons to the Warren Foundry & Pipe Co. The Beaver Engineering & Construction Co., New York, has been given the general contract on 215 tons of 8 to 12-in. by the local Department of Water Supply, Gas and Electricity. Denville, N. J., has placed 1260 tons of 4 to 8-in. pipe with R. D. Wood & Co.

Prices per net ton delivered New York: Water pipe 6-in. and larger, $36.25 to $37.25; 4-in. and 5-in., $41.25 to $42.25; 3-in., $51.25 to $52.25; Class A and gas pipe, $4 to $5 extra.

Old Material.—Offers of consumers to purchase at lower prices than prevail on their present contracts for most grades are apparently responsible for an undertone of weakness. No. 1 heavy melting steel seems to be firm at $13.50 per ton, delivered eastern Pennsylvania, but other grades show a slight downward tendency. Machine shop turnings are being purchased by brokers at $10.50 per ton, delivered Phoenixville, Pa., and in a few instances at $10.75 per ton, delivered. Yard grade heavy melting steel is still being delivered to a Harrisburg, Pa., consumer and to Phoenixville at $11 per ton, but on shipments to Pottsville, Pa., only $10.50, delivered, is being offered by most brokers. Chemical borings are quoted at $15 to $15.50 per ton, delivered to New Jersey chemical plants. Borings and turnings for blast furnace use are being shipped to Bethlehem, Pa., at $10 per ton, delivered, and a few small lots occasionally go to Sparrows Point, Md., at $10.50, delivered. Shipments of heavy melting steel to Conshohocken and of borings and turnings to Swedeland, Pa., continue under suspension. Foundry grade stove plate is quoted by brokers at $11 per ton, delivered to a West Mahwah, N. J., consumer, and at $11.50, delivered to Bridgeport, Conn.

Dealers' buying prices per gross ton, New York:

No. 1 heavy melting steel	$10.00 to $10.85
Heavy melting steel (yard)	7.00 to 7.50
No. 1 heavy breakable cast	11.50 to 12.50
Stove plate (steel works)	9.00
Locomotive grate bars	8.75 to 9.25
Machine shop turnings	7.00 to 7.25
Short shoveling turnings	7.00 to 7.50
Cast borings (blast furnace or steel works)	7.25 to 7.50
Mixed borings and turnings	6.50 to 7.50
Steel car axles	16.25 to 17.25
Iron car axles (nom.)	23.50 to 24.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	9.00 to 9.25
Forge fire	6.50 to 6.75
No. 1 railroad wrought	11.50 to 12.00
No. 1 yard wrought, long	10.50 to 11.00
Rails for rolling	10.25 to 10.75
Cast iron carwheels	11.50 to 12.00
Stove plate (foundry)	9.00 to 9.50
Mal'eable cast (railroad)	10.25 to 10.75
Cast borings (chemical)	11.50 to 12.50

Prices per gross ton, delivered local foundries:

No. 1 machinery cast	$14.00 to $14.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	12.50 to 13.00
No. 2 cast (radiators, cast boilers, etc.)	11.50 to 12.00

Warehouse Business.—Plates, shapes and bars are moving from stock in fair volume, and prices are being well maintained despite a tendency to shade on the more sizable tonnages, particularly when competition from material of foreign origin is encountered. Sheets are quiet, and concessions of 5c. to 10c. per 100 lb. continue to be made. In bolts and screws consumers are purchasing only small lots covering their week-to-week requirements, and the additional discounts usually given only to large-lot buyers are often extended to the purchasers of small requirements.

Reinforcing Bars.—Distributers in this territory have reduced the mill price on new billet steel reinforcing bars from 1.90c. to 1.85c., Pittsburgh. No particularly large jobs were closed in the last week, and the only inquiry of outstanding size is for 800 tons for a highway viaduct in Newark, which is being readvertised for bids. The Youngstown warehouse price is unchanged at 2.30c., or 2.67½c., delivered New York, and bars out of New York warehouse are quotable at 2.95c., delivered at job.

Coke.—Furnace coke has weakened and is now quotable at $2.75 to $3, Connellsville, for October shipment. The standard foundry grade is still fairly firm at $4 to $4.25, Connellsville, but there is not enough interest in spot purchases to test the market adequately on either grade. Delivered prices on Connellsville foundry coke are: To northern New Jersey, $8.03 to $8.28; to New York or Brooklyn, $8.79 to $9.04; to Newark or Jersey City, N. J., $7.91 to $8.16. By-product coke continues to range from $9.46 per net ton for West Virginia coke to $9.59 and $10.77 per net ton for local production, delivered Newark or Jersey City.

Cleveland

Steel Demand Reflects Curtailed Consumption—Heavy Melting Lower

CLEVELAND, Oct. 10.—The demand for finished steel shows no improvement over last month. Orders are for small lots for early needs, and there is very little, if any gain in operations by consuming plants. Reports from Detroit indicate that a few of the Michigan automobile companies are keeping up a fair rate of production, but one or two will slow up somewhat this month, so that the October output of motor cars may not equal that of September. The Ford Motor Co. is buying steel only in limited quantities and has not yet released any large production orders to parts manufacturers. It is still as uncertain as ever when the new Ford models will come on the market, and there is talk now that they will not be out before February.

Prices are being well maintained at 1.75c., Pittsburgh, on steel bars, plates and structural material, but efforts to get higher prices for small lots have virtually been discontinued. A few favored customers who were able to buy at 1.70c. before the price revisions are now unable to secure any concession from the 1.75c. price. A local mill continues to quote steel bars at 1.75c., Cleveland, and has closed some fourth quarter contracts on that basis, although few consumers of finished steel in any form are showing an interest in contracts. In the structural field new inquiries for 3500 tons of bridge work came from the Cleveland Union Terminals Co. during the week. Inquiry for steel for buildings has fallen off.

Iron Ore.—The dock balance of Lake Superior ore at Lake Erie ports Oct. 1 was 6,768,735 gross tons, as compared with 6,897,350 tons on the same date a year ago. Receipts at Lake Erie ports during September were 5,492,572 tons, and for the season until Oct. 1, 29,792,366 tons, as compared with 31,982,900 tons for the same period last year. Shipments from these docks during October were 3,491,986 tons, and for the season until Oct. 1, 21,556,077 tons, as compared with 23,486,365 tons up to Oct. 1 last year.

Pig Iron.—Sales have tapered off further and are now largely in small lots for early shipment. This business is evidently coming from consumers who have cleaned up their old contracts and for the present are buying iron as needed. Cleveland interests sold 10,000 tons during the week. Very little inquiry is pending. While prices are unchanged, the market does not have a very firm tone. On foundry and malleable iron $17, furnace, has become a somewhat more open Lake furnace price for delivery in Ohio and Indiana, although $17.50 is still commonly quoted. For Michigan deliv-

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Reinforcing steel bars	2.25c. to 3.00c.
Cold-finished rounds and hexagons	3.65c.
Cold-finished flats and squares	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)	4.65c.
Blue annealed sheets (No. 10)	3.25c.
No. 9 annealed wire, per 100 lb.	$2.90
No. 9 galvanized wire, per 100 lb.	3.35
Common wire nails, base per keg	2.90

*Net base, including boxing and cutting to length.

ery $18, furnace, is being quite generally adhered to. Many consumers in the automotive field are not taking all the iron called for in the monthly quotas of their contracts, and consequently some of the furnaces are not shipping all the iron they are making, although shipments are as large as in September. Shipments to consumers in other fields are generally good.

Prices per gross ton at Cleveland:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$19.00
Southern fdy., sil. 1.75 to 2.25	23.25
Malleable	19.00
Ohio silvery, 8 per cent	31.50
Basic, Valley furnace	17.00
Standard low phos., Valley furnace	27.50

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Semi-Finished Steel.—Several consumers have closed with a local producer for their sheet bar requirements for the last quarter at the ruling price of $34, Cleveland. Specifications are not coming out in very large volume.

Bolts, Nuts and Rivets.—Bolt and nut orders are light, although they show a slight gain over recent weeks. Comparatively little business is coming from the automotive industry, which is not buying any more freely than last month. Prices are firm. Rivet orders continue light.

Sheets.—Galvanized sheets, which have held rather steadily at 3.85c., Pittsburgh, have weakened and are now offered rather freely at 3.75c. Some of the mills are still getting orders for black sheets at 3c., although 2.90c., Pittsburgh, is rather commonly quoted. While 2.15c. is being named on blue annealed sheets, several of the mills are refusing to shade 2.25c., Pittsburgh, declaring that there is no profit in this grade at the lower price. The $2 a ton reduction on automobile body sheets has not stimulated sales, as consumers are buying only for early needs. Metal furniture stock is firm at ruling prices. While business in sheets is slightly better than a few weeks ago, demand is still far from satisfactory.

Strip Steel.—New demand for both hot and cold-rolled strip steel in this territory is light, as little business is coming from automobile parts manufacturers. A moderate amount of business is coming from automobile manufacturers in Michigan. These, however, are buying only for early requirements. Ruling prices are apparently holding on the small lots that are moving. Some confusion is being caused among buyers of cold-rolled strip since the recent revision of quantity differentials because some mills are quoting a 3c. base price, which is the price for lots of 3 tons or more, while others are adhering to 3.25c. as a base, which applies to less than 3 tons.

Reinforcing Bars.—Some fair-sized lots are pending in Detroit, but locally the market has become very dull. Rail steel bars are unchanged at 1.65c., mill, but this price might be shaded on a good-sized tonnage.

Warehouse Business.—Orders show some gain in number over last month, but they are still for very small lots. Sheets are moving better than recently, but the seasonal demand is less than at this time a year ago. Price irregularities have developed on sheets, but other warehouse prices are being well maintained.

Old Material.—A Valley district mill purchased 1000 tons of heavy melting steel from a Cleveland dealer during the week at $15 and is now out of the market. The absence of consumer demand and the holding up of shipping orders by some of the mills have had a depressing effect on prices, which have declined 25c. a ton on heavy melting steel and 25c. to 50c. a ton on some other grades. While scrap is not being thrown on the market in large volume, the supply is in excess of the demand. Dealers have virtually no orders against which they can make shipments and are finding it difficult to sell material that they desire to move quickly. Valley district dealers are paying $14.75 to $15 for heavy melting steel and $14 to $14.50 for compressed sheet scrap. The latter grade has declined sharply in Cleveland because there is no local demand.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$13.50 to $13.75
No. 2 heavy melting steel	13.00 to 13.25
Compressed sheet steel	12.50 to 12.75
Light bundled sheet stampings	11.00 to 11.50
Drop forge flashings	12.00 to 12.50
Machine shop turnings	9.00 to 9.25
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.50 to 13.75
No. 1 busheling	11.50 to 11.75
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phosphorus forging crops	16.50 to 17.00
Low phosphorus, billet, bloom and slab crops	17.00 to 17.50
Low phosphorus sheet bar crops	16.00 to 16.50
Low phosphorus plate scrap	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings	10.50 to 10.75
Mixed borings and short turnings	10.50 to 10.75
No. 2 busheling	10.50 to 10.75
Cupola Grades	
No. 1 cast	16.50 to 17.00
Railroad grate bars	12.00 to 12.50
Stove plate	12.00 to 12.50
Rails under 3 ft	18.00 to 18.50
Miscellaneous	
Railroad malleable	15.50 to 16.00
Rails for rolling	16.25 to 16.50

Philadelphia

Steel Prices Maintained Except on Sheets, But Pig Iron Is Weaker

PHILADELPHIA, Oct. 10.—In the past week there has been a further accentuation of the lull in buying that began to appear in the early days of this month. Despite the light demand, however, mills are maintaining 1.75c. per lb., base Pittsburgh, on plates, shapes and bars, and with no substantial tonnages in the market to provide a real test these prices are steady. Producers of shapes have adopted a firmer attitude, and instead of seeking full rolling schedules by occasionally offering concessions on sizes needed to fill out, they are apparently willing to execute orders on hand, even though continued changing of rolls is involved, rather than risk weakening the market.

Pig iron is about as quiet as at any time during the summer, and although prices are being maintained at $19.50 per ton, base, on foundry, with $20 per ton still being asked on small lots, the lower quotation is beginning to represent the current market on small orders and it is believed by buyers that a sizable tonnage might develop concessions from that price.

Sheet prices show no particular strength. This is especially true of blue annealed, which, under competition from hot rolled stripsheets, are said to have been sold at further concessions.

Pig Iron.—There is still a moderate volume of activity in small lots of low phosphorus iron, and one fairly sizable inquiry is current. No sales of basic have

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.60c. to 2.80c.
Plates, ⁷⁄₁₆-in.	2.80c. to 3.00c.
Structural shapes	2.50c. to 2.80c.
Soft steel bars, small shapes and iron bars (except bands)	2.50c. to 2.80c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	2.50c. to 3.00c.
Cold-finished steel, rounds and hexagons	4.00c.
Cold-finished steel squares and flats	4.50c.
Steep hoops	3.85c. to 4.15c.
Steel bands, No. 12 gage to ⅞-in., inclusive	3.60c. to 3.90c.
Spring steel	5.00c.
Black sheets (No. 24)	4.35c.
Galvanized sheets (No. 24)	5.20c.
Blue annealed sheets (No. 10)	3.30c.
Diamond pattern floor plates— ¼-in.	5.30c.
⁵⁄₁₆-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

been reported, and foundry iron buying is confined almost entirely to carload orders or a few hundred tons, on which $19.50 per ton, base, is the usual price. Sales of Virginia iron are small, and the price continues at $21 per ton, base, with the possibility of slight shading on a substantial purchase.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$20.26 to $20.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	20.76 to 21.26
East. Pa. No. 1X	21.26 to 21.76
Basic (delivered eastern Pa.)	20.00
Gray forge	20.50 to 21.00
Malleable	21.50 to 22.00
Standard low phos. (f.o.b. New York State furnace)	23.00 to 24.00
Copper bearing low phos. (f.o.b. furnace)	23.50 to 24.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	25.29 to 25.54
Virginia No. 2X, 2.25 to 2.75 sil.	25.79 to 26.04

Prices, except on low phosphorus, are delivered Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Billets.—Quotations continue at $33 to $34 per ton, Pittsburgh, for rerolling billets and at $38 to $39 for forging quality. Buying is confined to small lots to cover immediate requirements of the purchasers.

Bars.—Business is small, but prices are being maintained at 1.75c. per lb., base Pittsburgh, and with no large tonnages under consideration this is apparently the minimum on today's business.

Shapes.—Fabricators are sufficiently well covered at lower prices to carry them through this month and November in most cases. Mills, however, are showing considerably more firmness than for some time, so that 1.75c. per lb., Pittsburgh, is apparently the minimum price at present. The bridge for the Pennsylvania Railroad at Newark Bay, involving about 11,000 tons of steel, is not expected to be offered for bids until December or later.

Plates.—There has been some small purchasing by boiler makers and by oil companies for boiler construction. Otherwise there is but little activity. Prices, however, are fairly firm at 1.75c. per lb., Pittsburgh.

Sheets.—Black sheets range from 2.90c. to 3c. per lb., base Pittsburgh, and galvanized from 3.75c. to 3.85c., base. Blue annealed sheet prices are showing further softness in meeting the competition of hot rolled stripsheets, so that 2.15c., base, is said to have been shaded in some instances.

Warehouse Business.—Only small lots of material are moving from stock. Prices of plates, shapes and bars are being maintained fairly well at the present level, but sheets are showing a tendency to decline, especially when desirable orders are involved. There has been shading in blue annealed sheets, and a lower level of prices is expected.

Imports.—In the week ended Oct. 8, imports of ore through the port of Philadelphia included 2000 tons of Indian manganese ore, 850 tons of chrome ore from Greece and 485 tons from Portuguese Africa and 197 tons of Spanish iron ore. Total pig iron imports were 205 tons from the Netherlands. Steel receipts were 69 tons of steel bars from Sweden and 19 tons from France, and 160 tons of structural shapes from Germany and 80 tons from France.

Old Material.—Mills still show a desire to purchase at lower prices than brokers are willing to accept in contracts for substantial tonnages. At the present level of prices consumers continue to receive a fair tonnage of small lots of various grades that must be moved, but large transactions are not in evidence. No. 1 heavy melting steel is quiet at $14 per ton, with shipments going forward to consumers at Claymont, Del., and Bethlehem, Pa. Some machine shop turnings have been purchased at $11 per ton, delivered Phoenixville, Pa.

Prices per gross ton, delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$14.00
Scrap T rails	$13.00 to 13.50
No. 2 heavy melting steel	11.50
No. 1 railroad wrought	15.50 to 16.00
Bundled sheets (for steel works)	11.00 to 11.50
Machine shop turnings (for steel works)	11.00 to 11.50
Heavy axle turnings (or equivalent)	12.50 to 13.00
Cast borings (for steel works and rolling mill)	11.50
Heavy breakable cast (for steel works)	16.00
Railroad grate bars	13.00
Stove plate (for steel works)	13.00
No. 1 low phos., heavy, 0.04 per cent and under	18.50 to 19.50
Couplers and knuckles	16.25 to 16.75
Rolled steel wheels	16.00 to 16.50
No. 1 blast furnace scrap	10.50
Machine shop turnings (for rolling mill)	11.50 to 12.00
Wrought iron and soft steel pipes and tubes (new specifications)	12.50 to 13.00
Shafting	17.50 to 18.00
Steel axles	19.00 to 20.00
No. 1 forge fire	10.50 to 11.00
Steel rails for rolling	16.00 to 16.50
Cast iron carwheels	15.50 to 16.00
No. 1 cast	16.50 to 17.00
Cast borings (for chemical plant)	15.00 to 16.00

FIRE BRICK CLASSIFIED

Clay Shapes Covered by Report of Refractories Institute

Classification of fire clay shapes has been completed by the classification committee of the American Refractories Institute. The report, which has been adopted by the institute and thereby becomes the official classification for that kind of refractory shapes, now is available to those interested. Copies may be had upon application to Miss Dorothy A. Texter, secretary, 2202 Oliver Building, Pittsburgh.

Published in the form of a set of rules and formulae, the report is entitled, "Classification of Fire Clay Shapes Other Than Straight Tile." It is the cumulative result of more than 15 years' work of individual members of the committee and of many months' deliberation of the committee as a whole. The committee, composed of representatives of all important producing areas in the eastern half of the United States, had free access to the costs of manufacturers in all districts. Its conclusions, therefore, are as comprehensive as it was possible to make them.

Each rule and formula is definitely laid down in easily understood language and, once it has been established, one or more illustrative examples follow, to insure its proper interpretation. For instance, Rule I deals with the method of squaring irregular shapes. This, the basic rule for the entire system of classification, is logically followed by seven other rules of general character. These cover volume reduction; applying composite base; mold expense; quantity differentials, over-shipments; determining 9-in. equivalent and disposition of decimals in piece prices.

With the eight general rules established, every shape—from the simple arch, key or wedge to the intricate notched and hollow forms—is classified in accordance with 12 distinct groups.

The code fills a need which has long existed, and places the buying and selling of special fire brick shapes upon a sound, scientific basis. There is now no excuse for the manufacturer to lose money on an order for special shapes of fire clay brick, nor for the buyer to pay an exorbitant price through ignorance of the production costs.

The report is typical of the aims and purposes of the American Refractories Institute, which was organized in April, 1925, to take the place of the Refractories Manufacturers' Association. The latter was purely a trade association, with its activities largely commercial in character and its membership confined exclusively to manufacturers of refractories.

On the other hand, the institute was founded primarily for scientific ends, with membership open to users as well as makers of refractories. The thought has been that the problems of the industry would be more easily solved through discussions in which the producing and consuming views could be expressed. The research activities of the old association, through a fellowship at the Mellon Institute of Industrial Research, University of Pittsburgh, have been maintained and enlarged through cooperative efforts with the Bureau of Standards and with colleges having scientific departments.

San Francisco

Plate Market Is Active—Large Arrivals of Foreign Pig Iron and Coke

SAN FRANCISCO, Oct. 8 (*By Air Mail*).—Increased activity in the plate market, featured by the award of 1800 tons for a pipe line at McGill, Nev., and the inquiry for approximately 7000 tons for the Spring Valley Water Co. pipe line at San Francisco, together with a fair tonnage of structural awards, were the bright spots in the market this week.

While engineering construction work is not so extensive at it was this time a year ago, building activity is being well maintained and the outlook for the remainder of the year is encouraging.

Pig Iron.—The first direct shipment of Indian iron to arrive from Calcutta came into port on the Silver A this week. The vessel is unloading 750 tons for foundries in the bay district, and 100 tons for reshipment to Portland, Ore. There is also 500 tons consigned to San Pedro, Cal. One large importer reports 1100 tons of Indian iron en route and due in the early part of November. This material will be distributed in Los Augeles and San Francisco. Little improvement is noted in the rate of operation among jobbing foundries. The Western Harvester Co., Stockton, Cal., recently purchased 500 tons of Dutch material that was brought in and stored by an importer nearly two years ago. It is reported the price secured was around $21 a ton. In general, prices show no change from those quoted last week.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	25.00
**German foundry, sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—While prices on fabricated material continue extremely low in many instances, plain structural shapes continue firm at 2.40c., c.i.f. Coast ports. Included among the larger awards of the week were 600 tons for the Presbyterian Immanuel Church, Los Angeles, and 200 tons for a power house for the Goodrich Rubber Co., Los Angeles, both booked by the Union Iron Works. No new inquiries of importance developed during the week.

Plates.—Fabricators of plates have before them for figures the largest pipe line project that has come into the market for over a year. This calls for close to 7000 tons of ¼ to ½-in. plates for the San Andreas-Laguna Honda reservoir pipe line of the Spring Valley Water Co., San Francisco. Bids will be opened Oct. 15. The Nevada Consolidated Copper Co., San Francisco, has split 1800 tons between the leading interest and an Eastern independent for a 36-mile riveted pipe line to replace a wooden line now in use at McGill, Nev. The Western Pipe & Steel Co. took 200 tons for a 54-in. lock-bar pipe line for the Sacramento, Cal., sewage disposal plant. Bids were opened this week by the city of Los Angeles for an 84-in. welded penstock calling for 375 tons, on which the M. W. Kellogg Co. was low bidder. While 2.40c., c.i.f. Coast ports, continues to be quoted by the two leading interests, some business has recently been placed at 2.35c. It is thought that at least 2.30c. will develop on the inquiry for the Spring Valley line.

Bars.—The movement of reinforcing bars was not heavy this week, and only one award of over 100 tons was reported, an unnamed company having secured 140 tons for highway work near Redlands, Cal. Prices in the San Francisco district continue at 2.75c. to 2.85c. per lb. on 200-ton lots and over, and from 3c. to 3.10c. on smaller lots.

Cast Iron Pipe.—Demand, after several weeks of fair activity, has fallen off somewhat. Lettings include 315 tons of 4 to 10-in. Class B pipe for El Segundo, Cal., to the Pacific States Cast Iron Pipe Co. and 131 tons of 4 to 12-in. Class B pipe for the improvement of Park Avenue in Glendale, Cal., placed with E. L. Fleming. The United States Cast Iron Pipe & Foundry Co. was low bidder on 730 tons of 4 to 12-in. pipe for Gladstone, Ore., but no decision has yet been reached as to whether sand cast or centrifugal pipe will be purchased. The only new inquiry of the week calls for 385 tons of 2 to 6-in. sand cast or steel pipe for Burlington, Ore., bids on which will be opened Oct. 14. Prices are weak at $36 a ton, delivered.

Steel Pipe.—Save for an award of 486 tons of 3½ to 4½-in. lapwelded pipe for the Southern Counties Gas Co., San Luis Obispo, Cal., to the Jones & Laughlin Steel Corporation, little of interest has transpired in the steel pipe market.

Coke.—This material continues in good demand, and a shipment of English beehive and by-product coke arrived in port this week. Approximately 1500 tons will be unloaded here, 500 tons at Portland, Ore., and 2000 tons at San Pedro, Cal. Another large shipment of English coke is scheduled to arrive during November. Prices are unchanged, as follows:

English beehive coke, $15 to $16 per net ton at incoming dock; English by-product $12 to $13, and German by-product, $11.50 to $12.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.15c.
Soft steel bars	3.15c.
Small angles, ⅞-in. and over	3.15c.
Small angles, under ⅞-in.	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.75c.
Galvanized sheets (No. 24)	5.35c.
Structural rivets, ½-in. and larger	5.65c.
Common wire nails, base per keg	$3.35
Cement coated nails, 100-lb. keg	3.35

Birmingham

Fair Spot Demand for Pig Iron—Steel Works Operations Improve

BIRMINGHAM, Oct. 10.—Buying of October pig iron has been progressing at a fair rate from day to day, and a large part of the month's make has now been placed by the merchant producers. Beyond October there has been very little tonnage booked. Melters are buying only for early requirements. Most of the sales are for 100, 200 and 300-ton lots. There have been a few 500-ton orders, while a 1000-ton sale was made last week. Buying by pipe plants is still light and is being confined to orders about two weeks in advance of delivery. Lower prices are being sought, but the furnaces continue to hold firm at $17.25, base. Shipments are going forward at about the same rate as in September. There has been no change during the week in furnace operations. Nineteen are in blast, 10 being on foundry, seven on basic, one on ferromanganese and one on recarburizing iron.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil.	$17.25
No. 1 foundry, 2.25 to 2.75 sil.	17.75
Basic	17.25

Finished Steel.—Business is looking up and improvement is being reflected in steel works operations. Last week the Tennessee Coal, Iron & Railroad Co. operated all of its open-hearth furnaces at the Ensley Works, and four of the eight at the Fairfield Works. Open-hearth production is now larger than at any time since June or July. The Gulf States Steel Co. brought in another open-hearth furnace last week and now is operating five of the six at its Alabama City, Ala., works. The structural steel market is somewhat more active, and the Birmingham fabricating plants are fairly busy. Net tonnage secured last week was larger than for some time past. No changes have occurred in mill prices during the past week.

Cast Iron Pipe.—Demand is light. Orders from Detroit, amounting to around 10,000 tons, were received last week by several Birmingham plants. Bids on this tonnage were opened several weeks ago. The Galveston tonnage, on which bids were opened two weeks ago, has not yet been placed. Prices are weak, and the base of $29 to $30, Birmingham, is being shaded on desirable business.

Coke.—Foundry coke demand is gradually improving from week to week. The current output is being

largely taken. Some business for the first quarter of next year has been booked. Quotations remain at $5.50 per net ton, Birmingham, for contract and $6 for spot coke. The Alabama By-Products Corporation is placing its new unit of 49 ovens in operation this week.

Old Material.—There is little buying. There have been fair sales of No. 1 cast and stove plate, but the market is quiet in other lines. Prices are unchanged.

Prices per gross ton, delivered Birmingham district consumers' yards:

Heavy melting steel	$10.50 to $11.00
Scrap steel rails	11.00 to 12.00
Short shoveling turnings	8.50 to 9.00
Cast iron borings	8.50 to 9.00
Stove plate	13.00 to 14.00
Steel axles	16.00 to 17.00
Iron axles	18.00 to 20.00
No. 1 railroad wrought	10.00 to 11.00
Rails for rolling	12.00 to 13.00
No. 1 cast	15.00 to 16.00
Tramcar wheels	12.50 to 13.50
Cast iron carwheels	12.00 to 13.00
Cast iron borings, chemical	13.50 to 14.00

St. Louis

Steel Being Bought for Tornado Damaged Area—Scrap Continues to Decline

ST. LOUIS, Oct. 10.—Buying of pig iron took a spurt this week, and the sales of the Granite City maker totaled 6800 tons, the bulk of which went to Illinois melters. Most of the buying was in spot orders to balance mixtures. Consumers are still disinclined to cover for future requirements. Specifications against contracts show an increase over the preceding 30 days, with improvement in melt shown by stove and furnace manufacturers. The increase in shipments is in spite of the fact that some melters have suspended deliveries. Prices are unchanged.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25 f.o.b. Granite City, Ill.	$19.50 to $20.00
Northern No. 2 fdy., delivered St. Louis	21.66
Southern No. 2 fdy., delivered	21.67
Northern malleable, delivered	21.66
Northern basic, delivered	21.66

Freight rates: 81c. from Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Coke.—Peace has been declared in the Illinois coal fields, but this has had no effect so far either one way or the other on the coke situation. With colder weather, there has been a natural increase in the demand for domestic grades.

Finished Iron and Steel.—Demand for galvanized sheets continues strong, the Granite City mill having sufficient business booked to continue 100 per cent operations for the next four weeks. The demand for tin plate is excellent, but tank plate business is slow. Fabricators of structural steel are making inquiries as to shape prices in anticipation of considerable business in replacement work in the St. Louis tornado district. Warehouses have already taken some orders for galvanized sheets and structural steel for storm repair work.

Old Material.—There has been some buying during the last week by rolling mills and steel mills, but at lower prices. Buyers seemingly are in control of the situation. The principal items that consumers have been taking are heavy shoveling and heavy melting steel and rails for rolling. Dealers' prices have been cut to correspond with the prices at which they have sold material to the mills. Heavy melting steel, heavy shoveling steel, No. 2 railroad wrought, No. 1 busheling, cast iron borings, rails for rolling and machine shop turnings have declined 25c. a ton, and No. 1 locomotive tires, railroad springs and wrought iron bars and transoms are 50c. lower. Railroad lists include: Wabash, 2300 tons; Chicago & Eastern Illinois, 1000 tons; Cotton Belt, 900 tons; Nickel Plate, 800 tons; St. Louis-San Francisco, 600 tons; Missouri Pacific, 400 tons, and Kansas City Southern, 350 tons.

Prices per gross ton f.o.b. dealers' yards and delivered St. Louis district consumers' works:

Heavy melting steel	$11.25 to $11.75
No. 1 locomotive tires	13.50 to 14.00
Heavy shoveling steel	11.25 to 11.75
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart	13.75 to 14.25
Railroad springs	14.00 to 14.50
Bundled sheets	8.25 to 8.75
No. 2 railroad wrought	11.25 to 11.75
No. 1 busheling	10.00 to 10.50
Cast iron borings	9.00 to 9.50
Iron rails	12.50 to 13.00
Rails for rolling	14.50 to 15.00
Machine shop turnings	6.50 to 7.00
Steel car axles	19.00 to 19.50
Iron car axles	23.50 to 24.00
Wrought iron bars and transoms	19.50 to 20.00
No. 1 railroad wrought	11.00 to 11.50
Steel rails, less than 3 ft	15.00 to 15.50
Steel angle bars	12.25 to 12.75
Cast iron carwheels	13.00 to 13.50
No. 1 machinery cast	13.50 to 14.00
Railroad malleable	12.50 to 13.00
No. 1 railroad cast	13.00 to 13.50
Agricultural malleable	12.00 to 12.50
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24)	4.80c.
Galvanized sheets (No. 24)	5.35c.
Blue annealed sheets (No. 10)	3.60c.
Black corrugated sheets	4.65c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.60c.
Boiler rivets	3.80c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller	70
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, square, blank or tapped	60
Hot-pressed nuts, hexagon, blank or tapped	60

Toronto

Gain in Both Spot and Advance Buying of Pig Iron—Fair Demand for Scrap

TORONTO, ONT., Oct. 10.—Business has grown more active in the Canadian pig iron markets. Advance buying has become more general, and a fairly large number of melters have now covered their needs until the end of the year. However, about two-fifths of the contract consumers have not yet closed but appear to be awaiting further developments in the market. Spot sales have also shown an upward tendency. It is reported that many melters have but limited supplies on hand and that the current buying movement is both for immediate needs and to replenish stock holdings. While there has been no change in the daily melt of late, current orders for foundry and malleable pig iron for spot delivery range from 100 to 500 tons. It is apparent that some of the larger spot buyers are anxious to lay in supplies now so that they can take advantage of water freight rates. Competition from United States producers is more pronounced, but with the exception of the farm implement makers' business, Canadian producers are receiving the bulk of the tonnage placed. Prices are unchanged both at Toronto and at Montreal.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75	$23.60
No. 2 foundry, sil. 1.75 to 2.25	23.60
Malleable	23.60
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75	25.50
No. 2 foundry, sil. 1.75 to 2.25	25.50
Malleable	25.50
Basic	24.50
Imported Iron at Montreal Warehouse	
Summerlee	33.50
Carron	33.00

Old Material.—Sales compare favorably with those of the past two or three weeks. Some advance buying has been done, but most consumers are satisfied to adhere to the hand-to-mouth method of buying. Hamilton, Ont., consumers have been fairly prominent in the market of late, and some good contracts and spot orders have come from that district. Agricultural implement makers are also buying scrap in larger tonnages. Electric furnace operators are receiving regular shipments and are fairly well covered by contract for the remainder of the year. In the Montreal district dealers report a better demand both for local consumption and on export account. Speculative buying by

dealers is not a feature of the market. Dealers' purchases are mostly for direct shipment to consumers, and as a consequence they show a preference for material that does not have to go into the yards for sorting. Canadian scrap prices are unchanged.

Dealers' buying prices:

	Per Gross Ton	
	Toronto	Montreal
Heavy melting steel	$9.50	$9.00
Rails, scrap	10.00	10.00
No. 1 wrought	10.00	11.00
Machine shop turnings	7.00	6.00
Boiler plate	7.00	7.00
Heavy axle turnings	7.50	8.00
Cast borings	7.50	6.00
Steel turnings	7.00	7.00
Wrought pipe	5.00	6.00
Steel axles	14.00	19.00
Axles, wrought iron	16.00	21.00
No. 1 machinery cast	....	17.00
Stove plate	....	12.50
Standard carwheels	....	16.00
Malleable scrap	....	14.00
Per Net Ton		
No. 1 machinery cast	15.00	....
Stove plate	9.00	....
Standard carwheels	13.00	....
Malleable scrap	13.00	...

Boston

Low Price Quoted on Light Foreign Shapes—Steel Scrap Lower

BOSTON, Oct. 10.—Pig iron sales for the first half of this month will fall materially below those for the first halves of the two preceding months, owing to the fact that most New England foundries are well covered for the remainder of 1927 at the present rate of weekly melt. Melt, however, has shown an increase this week, although a slight one. Sales in the past week were mostly in car lots, and in the aggregate fell short of 2500 tons, the smallest week's total in many months. The Springfield Foundry Co., Springfield, Mass., is in the market for 300 tons of No. 1X iron for delivery during the remainder of 1927, and it is intimated that another Massachusetts melter will shortly ask for prices on 400 tons of No. 2X and 100 tons of No. 1X for shipment in this quarter. Otherwise prospective business is confined to car lots. Prices paid in the past week by foundries were substantially the same as those which ruled in the previous week.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25	$21.41 to $21.91
Buffalo, sil. 2.25 to 2.75	21.91 to 22.41
East. Penn., sil. 1.75 to 2.25	23.15 to 23.65
East. Penn., sil. 2.25 to 2.75	23.65 to 24.15
Virginia, sil. 1.75 to 2.25	25.96 to 26.21
Virginia, sil. 2.25 to 2.75	26.46 to 26.71
Alabama, sil. 1.75 to 2.25	24.16 to 26.02
Alabama, sil. 2.25 to 2.75	24.66 to 26.52

Freight rates: $4.91 from Buffalo, $3.65 from eastern Pennsylvania, $5.21 all rail from Virginia, $6.91 to $8.77 from Alabama.

Coke.—New England ovens report an improvement in the movement of by-product foundry coke. The improvement is slight, yet the first noted in several weeks. It is said to be due to the desire of some foundries to secure a reserve stock before snow flies, rather than to any increase in the New England melt of iron. The New England Coal & Coke Co. and the Providence Gas Co. are selling foundry coke at $12 a ton, delivered, within a $3.10 freight rate zone. Connellsville foundry coke is obtainable at concessions running up to around $1.50 a ton, but there is little demand for it.

Warehouse Business.—The movement of iron and steel out of warehouses continues to increase and is 25 to 30 per cent ahead of last month, according to conservative estimates. Prices are still elastic, owing to competition among warehouses themselves, steel mills and owners of foreign stock. Foreign material suitable for light iron work, which heretofore has been sold at 1.80c. per lb., f.o.b. Massachusetts points, was offered in the past week at 1.45c. The lowest price at which similar material is being offered by a domestic mill is 1.70c. per lb., base Pittsburgh.

Cast Iron Pipe.—Southbridge, Mass., has awarded 800 tons of 16-in. pipe to the Warren Foundry & Pipe Co., and Gardner, Mass., is about to place 100 tons of 8-in. No other open municipal business is reported. Low prices quoted on pipe in the past week or 10 days, however, have resulted in upward of 2000 tons being placed privately, in addition to several hundred tons sold to New England gas companies. Foundries maintain that the market for pipe smaller than 16-in. is firmer, although not actually higher, but admit that for 16-in. and larger dimension it is still soft.

Old Material.—Borings and turnings are about the only materials moving out of New England, with shipments confined to car lots. Practically no heavy melting steel is moving, and the market on that grade is 50c. a ton lower in sympathy with prices in outside markets. The American Steel & Wire Co., Worcester, Mass., has practically withdrawn from the bundled skeleton market, although it is offering to buy specially selected stock at $8.90 a ton, delivered, or around $6.90 a ton on cars, shipping point. Cotton ties, in long bundles, are moving in a limited way at $6.10 a ton on cars. While $13 to $13.50 a ton, on cars, is the general price on shafting, a Portland, Me., rolling mill is buying special lots of selected sizes at $14 to $14.50. The general range on textile machinery scrap is $15 to $15.50 a ton, delivered, but $15 is about all foundries will pay, and sales have just been put through on that basis. At least some dealers have arrived at the conclusion that anticipated price advances will not materialize for a long time; consequently offerings are somewhat larger.

Buying prices per gross ton f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$8.50 to $9.00
Scrap rails	8.50 to 8.75
No. 1 railroad wrought	10.50 to 11.00
No. 1 yard wrought	9.00 to 9.50
Machine shop turnings	6.00 to 6.50
Cast iron borings (steel works and rolling mill)	6.25 to 6.75
Bundled skeleton, long	6.00 to 6.50
Forged flashings	6.50 to 7.00
Blast furnace borings and turnings	5.75 to 6.00
Forge scrap	5.75 to 6.00
Shafting	13.00 to 13.50
Street car axles	17.00 to 17.50
Wrought pipe (1 in. in diameter, over 2 ft. long)	8.00 to 8.50
Rails for rerolling	10.50 to 11.00
Cast iron borings, chemical	10.25 to 10.75
Prices per gross ton delivered consumers' yards:	
Textile cast	$15.00 to $15.50
No. 1 machinery cast	15.50 to 16.00
No. 2 machinery cast	12.50 to 13.00
Stove plate	12.00 to 12.50
Railroad malleable	14.00 to 14.50

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	4.05c.
Squares and flats	4.55c.
Toe calk steel	6.00c.

Building Permits in 1926

Building permits in the principal cities in the United States in 1926 are reported and analyzed in a 129-page bulletin, No. 449, of the Bureau of Labor Statistics. Copies may be obtained at 20c. from the Superintendent of Documents, Government Printing Office, Washington.

Not only are the reported figures covered, but the new construction and repairs or alterations are worked out on a basis of dollars per inhabitant, the estimated population at the middle of the year being used. More than 300 cities are covered, including all of those having a population in excess of 25,000. The question of housing in relation to population is taken up and the number of families provided for reported in each city, as well as in the general groupings.

Buffalo

Sheet Prices Weaken—Scrap Buying Light but Prices Hold

BUFFALO, Oct. 10.—The pig iron market is very quiet, estimates of the total amount of inquiry ranging from 1000 to 1500 tons. The only sizable lot sought is 700 to 900 tons of foundry wanted by the General Electric Co. There is another inquiry for 400 tons of foundry, and the remainder of the business pending is made up of small lots. Ruling quotations, although they have not been subjected to a real test, are $17, furnace, for No. 2 plain, with differentials for higher silicon content, and $17.50 for malleable. It is probable that no iron has been sold at lower prices during the past week. Furnace men do not expect any wave of buying in the immediate future, since most consumers are well covered for the quarter.

Prices per gross ton, f.o.b. furnace:

No. 2 plain fdy., sil. 1.75 to 2.25	$17.00
No. 2X foundry, sil. 2.25 to 2.75	17.50
No. 1X foundry, sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	17.50
Basic	17.00
Lake Superior charcoal	27.28

Finished Iron and Steel.—Demand for bars and shapes is limited, with mill prices apparently firm at 2.015c., Buffalo. No large lots have been bought, and the outlook is not especially promising. In the sheet market inquiry is better, with a softening of prices apparent, particularly in black sheets. In fabricated steel the only sizable letting was 450 tons for the Ebsary Gypsum Co. at Caledonia, N. Y. Estimating has fallen off considerably in the reinforcing bar field. Bids were taken Monday on 300 tons of bars for the Buffalo city hall foundations. Mill operations average about 60 per cent of capacity.

Old Material.—Buying is limited and the market is very quiet, though prices are steady. About the only purchasing is being done by dealers to fill the orders of one of the two principal consumers. Dealers are offering $14 to $14.50 for heavy melting steel under this mill's new specifications. They are offering around $12.25 to $12.50 for hydraulic compressed sheets and about $13 to $13.25 for No. 1 busheling. One of the dealers reports a movement in No. 4 blast furnace scrap, as the grade is designated. It is similar to No. 2 busheling, and $9 is being offered for it. Some sales of machine shop turnings have strengthened the market on that grade, which now ranges from $9.75 to $10.25. Results of the New York Central and Erie closings had not been learned at this writing, but prices were expected to be low.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$14.75 to $15.00
No. 2 heavy melting steel	14.00 to 14.25
Scrap rails	14.50 to 15.00
Hydraulic compressed sheets	12.25 to 12.50
Hand-bundled sheets	9.00 to 9.50
Drop forge flashings	11.50 to 12.00
No. 1 busheling	13.00 to 13.25
Heavy steel axle turnings	12.75 to 13.25
Machine shop turnings	9.75 to 10.25
Acid Open-Hearth Grades	
Railroad knuckles and couplers	15.75 to 16.25
Railroad coil and leaf springs	17.00 to 17.50
Rolled steel wheels	15.75 to 16.25
Low phosphorus billet and bloom ends	17.00 to 17.50
Electric Furnace Grades	
Heavy steel axle turnings	12.75 to 13.25
Short shoveling steel turnings	10.75 to 11.00
Blast Furnace Grades	
Short shoveling steel turnings	10.75 to 11.00
Short mixed borings and turnings	9.75 to 10.00
Cast iron borings	10.00 to 10.50
No. 2 busheling	9.00 to 9.50
Rolling Mill Grades	
Steel car axles	15.00 to 16.00
No. 1 railroad wrought	13.00 to 13.50
Cupola Grades	
No. 1 machinery cast	14.75 to 15.25
Stove plate	13.25 to 13.75
Locomotive grate bars	11.00 to 11.50
Steel rails, 3 ft. and under	16.50 to 17.00
Cast iron carwheels	14.00 to 14.50
Malleable Grades	
Railroad	15.00 to 15.50
Agricultural	15.00 to 15.50
Industrial	15.00 to 15.50

Pacific Northwest

Active Demand for Structural Steel and Concrete Bars—Better Warehouse Trade

SEATTLE, Oct. 8 (*By Air Mail*).—Local steel jobbers report that trade in September was better than in any one month since last spring. While most of the new buying has been in small amounts to cover early needs, orders are more numerous and call for slightly larger lots. Contracts for structural steel are heavier, and there has been a good movement in reinforcing bars, but the market lacks the snap that it usually shows in the early fall.

Prices are only fairly firm, and it is reported that supposedly ruling prices are sometimes freely shaded. Building operations here have slowed up to some extent, and this has restricted the demand for materials used in new construction. Two large pulp and paper mills are being built in western Washington, and three others are projected with good prospects of being constructed. Making pulp and paper will be a very important industry in the Pacific Northwest in two or three years.

Pig Iron.—Demand is light and only for small lots. It is reported that some Indian iron has been bought for delivery in this market. Utah basic and No. 2 foundry are quoted at about $25 per gross ton, delivered Seattle.

Structural Steel.—Considerable work has been placed lately, and a good deal of tonnage is in sight. Bids on the steel for the Seattle Auditorium, 2000 tons, are to be opened Oct. 28. Other work includes 350 tons for a grain elevator for the port of Kelso, Wash., and an equal tonnage for a State highway bridge over the Duwamish River, while the Zellerbach interests of San Francisco will build pulp and paper mills at Aberdeen and Hoquiam, Wash., each of which will take 500 tons. The Northwest Pulp & Paper Co. will build large pulp and paper mills at Astoria, Wash., which will take about 1500 tons of steel. It has been decided by the local order of Elks to build a hotel as an addition to its building, requiring 800 to 1000 tons. It is understood that legal entanglements that have delayed the starting of work on the Northern Life building in this city have been adjusted, and that bids on the building will be asked in a short time. About 1500 tons of steel is called for. The Hofius Steel & Equipment Co. has booked 259 tons for a bridge over the Yakima River. Mill prices on shapes are reported as holding firm at 2.40c., delivered Seattle.

Plates.—Demand is light, and little new work is in sight. The city of Port Townsend, Wash., has decided to erect new waterworks to furnish a full supply of water for the pulp and paper mills to be built there, and it is estimated about 3000 tons of plates will be needed. Mills continue to quote plates at 2.40c., delivered Seattle, but not enough tonnage is coming out to test the market.

Reinforcing Bars.—Considerable work has been placed, but prices are very low and somewhat demoralized, slightly under 2c. per lb. having been quoted recently on desirable orders. Belgian bars are being offered in this market at 2c., with all charges prepaid. The North West Steel Rolling Mills, Inc., has taken 300 tons for a new hotel at Walla Walla, Wash.; 300 tons for a new gymnasium at Moscow, Idaho; 250 tons for a Broadway bridge at Portland, Ore., and 125 tons for new tanks for the Superior Portland Cement Co. at Concrete, Wash. The Pacific Coast Steel Co. is re-

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-finished flats, squares and hexagons	4.45c.
Rounds	3.95c.
Cold rolled strip steel	5.85c.
Black sheets (No. 24)	4.30c.
Galvanized sheets (No. 24)	5.15c.
Blue annealed sheets (No. 10)	3.80c.
Common wire nails, base per keg	$3.65
Black wire, base per 100 lb	3.90

ported to have taken upward of 1500 tons for pulp and paper mills at Port Townsend and Aberdeen, while a proposed mill at Hoquiam, Wash., will require about 1500 tons. Prices on reinforcing bars range from 2c. up to 2.35c., delivered Seattle, depending entirely on the size and desirability of the order.

Sheets.—The local demand for all grades of sheets is light, and prices are more or less uneven. Demand for galvanized is better than for blue annealed or black. Eastern mills quote No. 24 gage black at 3.55c., No. 24 galvanized at 4.45c., and No. 10 blue annealed at 2.82½c., delivered Seattle. These prices are subject to shading on desirable orders.

Track Materials.—Inquiries are in the local market for about 2000 tons of standard-section rails for logging companies for fall delivery. Tie plates are quoted at $52 per gross ton, delivered Seattle. Standard-section rails are bringing $43, Pittsburgh, but the full freight rate for Seattle delivery is not always obtained. The Pacific Coast Forge Co., local maker of railroad spikes, is quoting about $3.05 per keg, delivered Seattle, for standard sizes.

Old Material.—The local market is very dull. Dealers report that the railroads are getting what little business is being placed. Nominal prices are $10 per gross ton for heavy melting steel, $13 per net ton for cast iron scrap and $9 per gross ton for country scrap, delivered Seattle.

Warehouse Business.—Local jobbers report that the tonnage booked in September was larger than in any of the preceding three or four months. Warehouse prices on black and galvanized sheets have been advanced $5 per ton.

Cincinnati

Pig Iron Demand at Lowest Level of Year—Foundry Melt Declines

CINCINNATI, Oct. 10.—Pig iron buying has diminished to the lowest level of the year, and dealers are of the opinion that sales during the remainder of October will be light. Foundry operations in this district continue on a restricted scale. In fact, melters who have carried over considerable third quarter iron are using it slowly and in many cases will not need further tonnage until after Jan. 1. No orders over 200 tons have been booked in the past week, and the amount of pending inquiry is meager. The price situation is unchanged. Lake Erie iron is quoted at $17, base furnace, while southern Ohio foundry is selling at $19, base Ironton. Makers in the South are holding to $17.25, base Birmingham. The movement of silvery iron is reported to be less active, but prices are firm at $28.50, Jackson, for 8 per cent.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25....	$20.89
So. Ohio malleable .....$20.14 to	20.89
Alabama fdy., sil. 1.75 to 2.25...	20.94
Alabama fdy., sil. 2.25 to 2.75...	21.44
Tennessee fdy., sil. 1.75 to 2.25..	20.94
Southern Ohio silvery, 8 per cent	30.39

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—Consumers continue to buy cautiously and are confining their purchases to small quantities of material for immediate delivery. The amount of structural steel work under way is about normal for the fall season, but other lines that use heavy steel products are rather slow. This slackness is keenly felt by mills, which are having difficulty in obtaining enough tonnage to maintain operations on the present scale. Jobbers are taking only unimportant lots of bars, shapes and plates, and are endeavoring to keep stocks at a low point. In the sheet market there has been no substantial change. Orders and specifications have been of fair proportions, but no signs of improvement have appeared. Demand for galvanized sheets from the lower Mississippi Valley has been an outstanding feature, and in practically every case producers have been successful in selling at 3.85c., base Pittsburgh. The break of $2 a ton in blue annealed and black sheets has not disturbed prices in this market, which remain at 2.25c. and 3c., base Pittsburgh, respectively. It is believed, however, that a test of the market on a sizable tonnage would reveal a shading of current quotations. Bars, shapes and plates are bringing 1.75c., base Pittsburgh, on lots of 100 tons or more, while 1.80c. is the prevailing price on single carloads. Wire goods are more active than a week ago, and the season's business in fencing products is expected to be normal. Common wire nails are quoted at $2.69 a keg, delivered at Cincinnati, and plain wire is bringing $2.54 per 100 lb.

Warehouse Business.—The volume of orders placed with local jobbers has been fairly good, but the total tonnage has been far from satisfactory. Prices of all products are firm and unchanged.

Reinforcing Bars.—The Pollak Steel Co. will supply 200 tons for retaining walls along the new Cleves-Warsaw pike near this city.

Coke.—Slack operation of foundries in this territory has been a depressing factor in the coke market. Dealers state that shipments of by-product foundry coke this month will fall short of those in September and in August. Domestic grades are showing a slight betterment, but are not selling in the volume which is normal for this time of the year. Sales of Wise County and New River beehive coke have been small. In order to meet the competition of an automobile manufacturer who is selling excess coke output in Michigan, a by-product coke maker is understood to be planning on marketing its Detroit production in that city and in supplying the outside trade from its Ironton and Ashland, Ky., ovens.

Foundry coke prices per net ton, delivered Cincinnati: By-products coke, $5.52 to $9.64; Wise County coke $7.59 to $8.00; New River coke $10.00 to $10.59. Freight rates: $2.14 from Ashland, Ky.; $2.59 from Wise County and New River ovens.

Old Material.—There has been little activity in the scrap market. Prices are so low that many dealers are reported to be holding material rather than to sell it at current quotations.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy melting steel.....$11.75 to	$12.25
Scrap rails for melting..... 12.75 to	13.25
Loose sheet clippings ..... 9.00 to	9.50
Bundled sheets ..... 9.50 to	10.00
Cast iron borings ..... 8.50 to	9.00
Machine shop turnings ..... 8.00 to	8.50
No. 1 busheling ..... 10.00 to	10.50
No. 2 busheling ..... 7.50 to	8.00
Rails for rolling..... 13.50 to	14.00
No. 1 locomotive tires..... 13.50 to	14.00
No. 1 railroad wrought ..... 11.00 to	11.50
Short rails ..... 17.50 to	18.00
Cast iron carwheels ..... 13.50 to	14.00
No. 1 machinery cast ..... 16.50 to	17.50
No. 1 railroad cast ..... 14.00 to	14.50
Burnt cast ..... 8.00 to	8.50
Stove plate ..... 9.50 to	10.00
Brake shoes ..... 10.00 to	10.75
Railroad malleable ..... 12.50 to	13.00
Agricultural malleable ..... 12.00 to	12.50

Warehouse Prices, f.o.b. Seattle

	Base per Lb.
Plates and structural shapes.....	3.00c.
Soft steel bars	3.00c.
Reinforcing bars	2.90c.
Black sheets (No. 24).....	4.85c.
Galvanized sheets (No. 24).....	5.40c.
Blue annealed sheets (No. 10).....	3.85c.
Rivets, button and cone head.....	5.00c.
Rivets, tank .....50 per cent off list	
Common wire nails, base per keg.....$3.25	
Cement coated nails, 100-lb. keg..... 3.25	

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes....	3.40c.
Bars, soft steel or iron.....	3.30c.
Reinforcing bars	3.30c.
Hoops ..... 4.00c. to	4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel..... 4.75c. to	5.00c.
Black sheets (No. 24).....	4.05c.
Galvanized sheets (No. 24).....	4.90c.
Blue annealed sheets (No. 10)...	3.60c.
Structural rivets	3.85c.
Small rivets .....65 per cent off list	
No. 9 annealed wire, per 100 lb.....$3.00	
Common wire nails, base per keg..... 2.95	
Cement coated nails, base 100 lb. keg..... 2.95	
Chain, per 100 lb..... 7.55	
	Net per 100 Ft.
Lap-welded steel boiler tubes, 2-in.....$18.00	
4-in. 38.00	
Seamless steel boiler tubes, 2-in..... 19.00	
4-in. 39.00	

Detroit

Ford Model Expected to Appear Nov. 1 —Alloy Steel Demand Gains

DETROIT, Oct. 10.—The market in this district reflects in no small degree the general situation in the automotive field, which at the present time is not particularly active.

Various estimates have been made as to just when the new Ford model will come on the market. Changes and delays have made it necessary to revise these from time to time, and perhaps it is still too soon to estimate closely. However, the present opinion seems to agree on Nov. 1 as the time when retooling for the new car will be completed. It would seem reasonable to assume that production will commence about that time and increase rapidly thereafter. Production in three other motor car plants has been curtailed somewhat on account of model revisions.

There has been little change in prices of hot-rolled alloy steel bars. For the several grades of nickel, chrome, vanadium and molybdenum steels, prices on orders placed have adhered closely to the minima as recently listed. The demand for the alloy steels during the past week has shown improvement. It is now estimated that the volume of tonnage booked this month will surpass that of last month.

The market on automobile body sheets remains unchanged at 4.15c., Pittsburgh, while fender strip is quoted at 4.60c. to 4.65c., Pittsburgh.

Structural shapes and plates are still selling at 1.75c., Pittsburgh, to large buyers. Demand is not heavy, owing to curtailed construction of large buildings, such as office buildings, hotels and theaters.

Old Material.—The general tone of the market in this district is weak, but no further price reductions have been recorded. No sales involving any tonnage have been made during the past week. Shipments of pig iron for the month promise to be higher than the total for September, and a 50c. advance in price has been established.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Heavy melting and shoveling steel	$12.25 to $12.75
Borings and short turnings	9.00 to 9.50
Long turnings	7.50 to 8.00
No. 1 machinery cast	17.00 to 18.00
Automobile cast	18.50 to 19.50
Hydraulic compressed sheets	11.00 to 11.50
Stove plate	11.50 to 12.50
No. 1 busheling	10.00 to 10.50
Sheet clippings	7.50 to 8.00
Flashings	10.25 to 10.75

Nature of the Bower-Barff Coating on Iron

A rust-resisting coating for iron or steel, discovered and perfected about 50 years ago by F. S. Barff and G. Bower, has been used since then to a considerable extent for commercial articles. They found that if iron pieces were heated to about 730 deg. C. in an air-tight furnace, blown with steam and cooled in air, a hard, smooth, adherent and rust-resisting coat about 0.2 mm. (0.01 in.) thick was produced. While it was surmised that this coating was a mixture of iron oxides, its exact composition was unknown. The inventor believed that it was largely magnetic oxide, and ascribed its wear-resisting properties to this oxide.

Recent studies by R. M. Bozorth of the Bell Telephone Laboratories (Reprint B-247) using X-ray analysis show that the coating is nearly all ferrous oxide (FeO). Overlying this is a layer of magnetic oxide (Fe_3O_4) about 2 per cent as thick as the underlying oxide, and over this again is a still thinner outer layer of ferric oxide (Fe_2O_3).

The Stahlwerke Hoesch, Dortmund, the largest independent sheet and wire mill in Germany, has begun the erection of a new sheet mill, which, it is claimed, will be the most modern in Europe. Sheets will be rolled by the continuous process from steel ingots to the thin gages and special attention will be devoted to labor saving devices.

Steel Corporation's Orders Decreased in September

After three successive months of increases in unfilled orders, the business on the books of United States Steel Corporation at the end of September, showed a decrease. On Sept. 30, the total unfilled orders was 3,148,113 tons or 47,924 tons less than the total on Aug. 31, of 3,196,037 tons. There was an increase in August of 54,023 tons, in July of 88,768 tons and in June of 2305 tons. There had been five monthly decreases prior to June.

The following table gives the unfilled tonnage by months, commencing with January, 1925:

	1927	1926	1925
Jan. 31	3,800,177	4,882,739	5,037,323
Feb. 28	3,597,119	4,616,822	5,284,771
Mar. 31	3,553,140	4,379,935	4,863,564
April 30	3,456,132	3,867,976	4,446,568
May 31	3,050,941	3,649,250	4,049,800
June 30	3,053,246	3,478,642	3,710,458
July 31	3,142,014	3,602,522	3,539,467
Aug. 31	3,196,037	3,542,335	3,512,803
Sept. 30	3,148,113	3,593,509	3,717,297
Oct. 31	.....	3,683,661	4,109,183
Nov. 30	.....	3,807,447	4,581,780
Dec. 31	.....	3,960,969	5,033,364

The high record in unfilled orders was 12,183,093 tons at the close of April, 1917. The lowest was 2,674,757 tons on Dec. 31, 1910.

Federal Specifications for Foundry Iron Proposed

The Federal Specifications Board is adopting and promulgating purchase specifications for commercial commodities purchased by the various departments and establishments of the United States Government. These specifications, in the formative stage, are being submitted to representative manufacturers for their comment and criticism. One of these follows:

The foundry iron shall be furnished in grades Nos. 1 to 4, as specified in the table. All pigs shall be free from excessive sand or slag, and not more than 12 per cent of sow iron shall be accepted. Pig iron of special grades shall conform to the requirements as to chemical composition specified in the contract or order and in such cases the following variations shall be allowed:

Silicon—plus or minus	0.25 per cent
Manganese—plus or minus	0.20 per cent
Phosphorus—plus or minus	0.10 per cent
Total carbon—plus or minus	0.25 per cent or minimum as specified.
Sulphur—Maximum as specified.	

Table of Composition for Four Grades

Grade	Silicon, Per Cent	Sulphur, Maximum Per Cent	Manganese, Per Cent	Phosphorus, Per Cent
No. 1	2.75-3.25	0.04	0.50-1.00	0.50-0.80
No. 2	2.25-2.75	0.05	0.50-1.00	0.50-0.80
No. 3	1.75-2.25	0.05	0.50-1.00	0.50-0.80
No. 4	1.25-1.75	0.05	0.50-1.00	0.50-0.90

Method of Inspection and Tests

One pig shall be taken for every four tons in the lot, chosen from different locations so as to represent as nearly as possible the average quality of the lot. A lot shall always consist of pigs from the same casts.

The pigs selected for test shall be broken so as to present a clean fracture over the cross section of the pig. One-half of each pig shall have drillings taken from three points, triangularly spaced on the clean part of the fracture. An equal proportion of drillings from each pig of a lot shall be thoroughly mixed and analysis made from this sample. No resampling will be permitted.

The inspector shall obtain not less than 6 oz. of the sample, taken and mixed as above, for analysis. In case the first analysis shows that the material does not conform to the specifications, a check analysis shall be made. The average of these analyses shall be considered final.

Notes

1. Bidders shall state whether the iron they propose to furnish is machine cast or sand cast.

2. Other things being equal, preference will be given to machine cast pig iron.

3. Contracts or orders should state the minimum total carbon desired.

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	Oct. 10	Oct. 8	Oct. 7	Oct. 6	Oct. 5
Lake copper, N. Y.	13.25	13.25	13.25	13.25	13.25
Electrolytic copper, N. Y.*	12.95	12.95	13.00	13.00	13.00
Straits tin, spot, N. Y.	58.50	....	58.50	58.50	58.75
Lead, New York	6.25	6.25	6.25	6.25	6.25
Lead, St. Louis	6.00	6.00	6.00	6.00	6.00
Zinc, New York	6.42½	6.40	6.40	6.40	6.37½
Zinc, St. Louis	6.07½	6.05	6.05	6.05	6.02½

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, Oct. 10.—Tin as well as zinc has been fairly active the past week with prices steady to higher. Copper has quieted down with a tinge of weakness and the lead market is practically unchanged. Antimony is again a little higher. Because of the Columbus Day holiday on Oct. 12, this market is written on Oct. 10.

Copper.—While foreign buying has been maintained at a fairly large volume, there has not been the expected increase in domestic purchases. There has been a moderate amount of business from this source, but consumers here seem to be waiting for the September statistics, which will be out the middle of the week. These are expected to be favorable to sellers, and such being the case, most producers are adhering to 13.25c., delivered in the Connecticut Valley for electrolytic copper. In fact it is stated there is only one seller willing to shade this price and some metal is available and has been sold at 13.20c., delivered. It is conceded that domestic consumers must still buy metal for October, and particularly for November delivery, and it is the opinion of sellers that foreign melters must still purchase a good deal for early delivery. Therefore the general tone of the market is optimistic and the present lull is considered temporary. Lake copper is quoted at 13.25c., delivered.

Tin.—While on the surface the appearance of the market indicated quiet conditions, sales for the week ended Saturday were fairly large, totaling 1200 to 1300 tons for all positions, including February and March. It was a dealers' market. These were trading in and out and consumers were not at all interested. There were attempts to depress the market several times with some success. Today, Monday, the market was quiet with about 100 tons changing hands, all for distant delivery, with nearby metal largely neglected. Spot Straits tin today was quoted at 58.50c., New York, and prices in London were again lower than a week ago, with spot standard quoted at £266 5s., future standard at £264 2s. 6d., and spot Straits at £272 15s. The Singapore market today was £267 5s. Arrivals thus far this month have been 1290 tons, with 6795 tons reported afloat.

Lead.—The market has held very well in the face of considerably lower prices at London. The expected reduction of its price of 6.25c., New York, by the leading interest, now long overdue, has not materialized, though lead at London today at £20 2s. 6d. per ton figures back below 6c., duty paid, New York, making it easily possible for foreign lead to be imported. Some feel that no steps will be taken at present to prevent this. In the outside market the quotation stands at 6c., St. Louis.

Zinc.—Business of fairly large proportions has resulted in slightly higher prices with sales fairly large at the 6c. level, which prevailed until recently, prime Western today being quoted at 6.07½c. to 6.10c., St. Louis, or 6.42½c. to 6.45c., New York. Statistics for September are expected in a day or two and several look for a decrease in stocks of refined metal. Ore prices are unchanged at $38, Joplin, with production of about 15,000 tons for the week ended Saturday, and with sales the largest in several weeks of about 18,000 tons.

Nickel.—Ingot nickel in wholesale lots is quoted at 35c. with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

Antimony.—Buying by dealers and less inclination

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	60.00c. to 61.00c.
Tin, bar	62.00c. to 63.00c.
Copper, Lake	14.50c.
Copper, electrolytic	14.25c.
Copper, casting	13.75c.
Zinc, slab	7.50c. to 8.50c.
Lead, American pig	7.50c. to 8.50c.
Lead, bar	9.75c. to 10.75c.
Antimony, Asiatic	13.00c. to 14.00c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure)	27.00c. to 28.00c.
Aluminum ingots, No. 12 alloy	26.00c. to 27.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ½ and ½	39.50c. to 40.50c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	64.00c.
Tin, bar	66.00c.
Copper, Lake	14.00c.
Copper, electrolytic	14.00c.
Copper, casting	13.25c.
Zinc slab	7.75c.
Lead, American pig	7.25c.
Antimony, Asiatic	16.00c.
Lead, bar	9.25c.
Babbitt metal, medium grade	19.50c.
Babbitt metal, high grade	67.25c.
Solder, ½ and ½	37.50c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	18.25c. to 19.00c.
Copper, hot rolled	22.00c. to 23.00c.
Copper, cold rolled, 14 oz. and heavier,	24.25c. to 25.25c.
Seamless Tubes—	
Brass	23.12½c. to 24.12½c.
Copper	24.00c. to 25.00c.
Brazed Brass Tubes	26.25c. to 27.25c.
Brass rods	16.00c. to 17.00c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.50c. to 11.00c.
Zinc sheets, open	11.00c. to 11.25c.

Non-Ferrous Rolled Products

The mill price on lead full sheets was reduced ¼c. on Oct. 5 and is now quoted at 9.75c. to 10c. Bronze, brass and copper products and zinc sheets have not changed since the advances of Aug. 3 and 5 respectively.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	18.25c.
Copper, hot rolled	22.00c.
Zinc	10.00c.
Lead (full sheets)	9.75c. to 10.00c.
Seamless Tubes—	
High brass	23.12½c.
Copper	24.00c.
Rods—	
High brass	16.00c.
Naval brass	18.75c.
Wire—	
Copper	15.25c.
High brass	18.75c.
Copper in Rolls	21.00c.
Brazed Brass Tubing	26.25c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	35.50c.
Tubes, base	45.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	19.25c.
Copper, hot rolled	22.00c.
Copper, cold rolled, 14 oz. and heavier	24.25c.
Zinc	11.00c.
Lead, wide	10.00c.
Seamless tubes—	
Brass	24.62½c.
Copper	25.50c.
Brazed Brass Tubes	28.50c.
Brass Rods	16.00c.

to sell in certain quarters has made for a stronger market, with Chinese metal for all positions quoted at 11.50c., duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 26c., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, Oct. 10.—Prices as a rule are stronger. A fair volume of domestic sales and an active foreign demand are holding prices for copper steady. Old metals are in small demand.

Prices, per lb., in carload lots: Lake copper, 13.35c.; tin, 60c.; lead, 6.10c.; zinc, 6.15c.; in less-than-carload lots, antimony, 12.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10c.; copper bottoms, 9c.; red brass, 9c.; yellow brass, 6.75c.; lead pipe, 5c.; zinc, 3.50c.; pewter, No. 1, 34c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 13.25c.; all being dealers' prices for less-than-carload lots.

FABRICATED STRUCTURAL STEEL

Awards of 31,750 Tons—29,400 Tons in New Projects Added to Pending Work

Structural steel awards during the week amounted to 31,750 tons, the largest of which were an athletic club in Pittsburgh which took 2500 tons and a steel plant building in Chicago requiring 2400 tons. Included in the 29,400 tons added to pending work were a bridge at Bristol, R. I., and a waterworks at Port Townsend, Wash., which will require 3000 tons each. Awards follow:

RYE, N. Y., 200 tons, New York, New Haven & Hartford Railroad bridge at Purchase Street to Phoenix Bridge Co. and bridge at Locust Avenue to unnamed fabricator.

PHILADELPHIA, 1700 tons, annex to City Hall, to American Bridge Co.

NEW YORK, 8900 tons reported to the Structural Steel Board of Trade; 6400 tons in the following jobs not previously reported: Office building in Newark, Y. M. C. A. at Elizabeth, N. J., and 15-story apartment building at 153 East Seventy-second Street, to Hedden Iron Construction Co.; three-story garage at 212-16 East Seventy-fourth Street, one-story garage at West New York, N. J., public school No. 14 in the Bronx, theater at Elmhurst, L. I., public school No. 113 in Queens, theater at Hempstead, L. I., 15-story apartment building at 248 West Seventy-second Street and 15-story apartment building at Ninety-sixth Street and Park Avenue, to Harrison Structural Steel Co.; 15-story apartment building at 963 Fifth Avenue and apartment building at Fifty-eighth Street and Sutton Place, to Paterson Bridge Co.; Corn Exchange Bank building at 231st Street and Broadway and hospital in Elizabeth, N. J., to Lehigh Structural Steel Co.; St. John's Hospital at Atlantic and Albany Avenues, Brooklyn, to George A. Just Co.

NEW YORK, 150 tons, miscellaneous work on Riverside Drive, to American Bridge Co.

BROOKLYN, 1500 tons, boiler house for National Sugar Co., to Hedden Iron Construction Co.

CALEDONIA, N. Y., 450 tons, addition to Ebsary Gypsum Co., to Kellogg Structural Steel Co., Buffalo.

SYRACUSE, N. Y., 400 tons, private school, to Smith & McCraffrey.

NEW YORK, ONTARIO & WESTERN RAILROAD, 200 tons, bridge at Fulton, N. Y., to McClintic-Marshall Co.

JERSEY CITY, 500 tons, building for American Can Co., to American Bridge Co.

CAMDEN, N. J., 600 tons, office building, to an unnamed Philadelphia fabricator.

PHILADELPHIA, 500 tons, building for Watson Mfg. Co., to Belmont Iron Works.

Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their use.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	11.25c.	12.75c.
Copper, heavy and wire	11.00c.	12.00c.
Copper, light and bottoms	9.50c.	10.50c.
Brass, heavy	7.00c.	8.50c.
Brass, light	5.50c.	7.25c.
Heavy machine composition	9.00c.	10.25c.
No. 1 yellow brass turnings	7.75c.	8.25c.
No. 1 red brass or composition turnings	8.00c.	9.00c.
Lead, heavy	5.125c.	5.375c.
Lead, tea	4.25c.	4.75c.
Zinc	4.00c.	4.50c.
Sheet aluminum	13.50c.	15.50c.
Cast aluminum	13.50c.	15.50c.

PHILADELPHIA, 500 tons, garage on Locust Street, to an unnamed local fabricator.

PHILADELPIA, 150 tons, highway bridge, to Belmont Iron Works.

PILADELPHIA, 300 tons, Automobile Club, to Shoemaker Bridge Co.

PENNSYLVANIA RAILROAD, 1000 tons, substation at Philadelphia, to Belmont Iron Works.

PENNSYLVANIA RAILROAD, 400 tons, bridges; 175 tons to Fort Pitt Bridge Works and 225 tons to Bethlehem Steel Co.

PENNSYLVANIA RAILROAD, 475 tons, car shops at Wilmington, Del., to an unnamed fabricator.

PENNSYLVANIA RAILROAD, 350 tons, station at Lancaster, Pa., to Belmont Iron Works.

ALLENTOWN, PA., 500 tons, highway bridge, to Bethlehem Steel Co.

CARLISLE, PA., 300 tons, Dickinson College gymnasium, to McClintic-Marshall Co.

BALTIMORE, 200 tons, House of Correction, to Deitrich Brothers.

BALTIMORE, 175 tons, building for Central Fire Insurance Co., to Deitrich Brothers.

BALTIMORE, 400 tons, mill building for American Smelting & Refining Co., to McClintic-Marshall Co.

CHESAPEAKE & OHIO RAILWAY, 300 tons, bridge caissons at Cincinnati, to an unnamed local fabricator.

OLD HICKORY, TENN., 1200 tons, building for Dupont company, to Virginia Bridge & Iron Works.

GALION, OHIO, 125 tons, building for Galion Iron Works, to Massillon Bridge & Structural Co.

TOLEDO, OHIO, 165 tons, building for National Milling Co., to Massillon Bridge & Structural Co.

PITTSBURGH, 2500 tons, Keystone Athletic Club, to Fort Pitt Bridge Works.

BIRMINGHAM, 1000 tons, Southern Railway, miscellaneous projects, to Virginia Bridge & Iron Co.

NEWNAN, GA., 350 tons, addition to plant of Armco Co., to Virginia Bridge & Iron Co.

PONTOTOC MISS., tonnage being estimated, underpass for Gulf, Mobile & Northern Railroad, to Virginia Bridge & Iron Co.

BORDER, TEX., 800 tons, highway bridge, to Missouri Valley Bridge & Iron Co., Leavenworth, Kan.

CHICAGO, 2400 tons, open-hearth building for Wisconsin Steel Co., to McClintic-Marshall Co.

CHICAGO, 1800 tons, 106th Street bridge, to American Bridge Co.

SAN FRANCISCO, 1800 tons, plates, pipe-line at McGill, Nev., for Nevada Consolidated Copper Co. to two Eastern producers.

LOS ANGELES, 600 tons, Presbyterian Church, to Union Iron Works.

LOS ANGELES, 200 tons, power house for Goodrich Rubber Co., to Union Iron Works.

LOS ANGELES, 160 tons, Peerless Laundry, to Llewellyn Iron Works.

LOS ANGELES, 800 tons, County medical building, to Union Iron Works, local.

SACRAMENTO, CAL., 200 tons, pipe-line for the city, to Western Pipe & Steel Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

BRISTOL, R. I., 3000 tons, bridge.

BROOKLINE, MASS., 200 tons, sales room and service station, Cadillac Motor Car Co.

NEW YORK, 1500 tons, Bellevue Hospital.

PEEKSKILL, N. Y., 200 tons, highway bridge.

MIDDLETOWN, N. Y., 150 tons, garage.

NEWARK, N. J., 2200 tons, highway viaduct; readvertised bids on Oct. 17.

HOBOKEN, N. J., 200 tons, Stanley Theater.
CAMDEN, N. J., 150 tons, hotel.
BRYN MAWR, PA., 200 tons, bank.
PENNSYLVANIA RAILROAD, 300 tons, bridge.
LANSDOWNE, PA., 100 tons, Pennsylvania Railroad bridge; low bidder McClintic-Marshall Co.
BRYN MAWR, PA., 140 tons, building for Bryn Mawr Trust Co.; bids in.
PHILADELPHIA, 400 tons, building for Broad Street Trust Co.; bids in.
WESTVILLE, N. J., 450 tons, bridge over Big Timber creek; bids in.
CLEVELAND, 1000 tons, Cleveland Union Terminals Co., lift span for Eagle Avenue bridge.
STATE OF NEW YORK, 1700 tons, highway bridges; bids taken.
FLINT, MICH., 700 tons, Harrison-Third Building.
AKRON, OHIO, 500 tons, post office building.
AKRON, OHIO, 200 tons, post office.
CLEVELAND, 2500 tons, Cleveland Union Terminals Co., Prospect Avenue bridge; bids taken.
INDIANAPOLIS, IND., 100 tons, building for Butler University.
BOONE COUNTY, IOWA, 400 tons, bridge across the Des Moines River.
BROOKPORT, ILL., 500 tons, bear trap dam across the Ohio River.
CHICAGO, 1100 tons, Harriet Hammond McCormick Y. W. C. A.
CHICAGO, 1700 tons, Crawford Avenue bridge.
TOPEKA, KAN., 400 tons, cafeteria for the Santa Fe System.
SEATTLE, WASH., 2000 tons, auditorium; bids to be opened Oct. 28.
SEATTLE, 800 to 1000 tons, hotel for Elks Club.
SEATTLE, 1500 tons, Northern Life Insurance Building; bids to be called soon.
KELSO, WASH., 350 tons, grain elevator.
DUWAMISH RIVER, WASH., 350 tons, State bridge.
ABERDEEN, WASH., 500 tons, pulp and paper mill for Zellerbach Paper Co., San Francisco.
HOQUIAM, WASH., 500 tons, pulp and paper mill for Zellerbach Paper Co.
ASTORIA, WASH., 1500 tons, paper mill for Northwest Pulp & Paper Co.
PORT TOWNSEND, WASH., 3000 tons of plates for the municipal waterworks.
LOS ANGELES, 375 tons, riveted pipe-line for the city; M. W. Kellogg Co., low bidder.

REINFORCING STEEL

Awards of 12,800 Tons Include 7700 Tons for St. Louis Sewer Project

Included in the 12,800 tons of concrete reinforcing bars reported booked in the last week are 7700 tons for a sewer project in St. Louis and 1500 tons for a paper and pulp mills at Port Townsend and Aberdeen, Wash. Pending work, aggregating 6100 tons, includes 1500 tons for a pulp and paper mill at Hoquiam, Wash., and 1000 tons for a Chicago sewer. Awards follow:

NEW YORK, 300 tons, loft building on Forty-fifth Street, to Truscon Steel Co.

CINCINNATI, 200 tons, retaining walls for Cleves-Warsaw Pike, to Pollak Steel Co.

CHICAGO, 400 tons of rail steel bars, apartment building at 6700 Crandon Avenue, to Calumet Steel Co.

CHICAGO, 200 tons of rail steel, building for De Paul University, to Calumet Steel Co.

CHICAGO, 800 tons of rail steel bars, *Chicago Evening Post* Building, to Calumet Steel Co.; previously reported to Inland Steel Co.

SPRINGFIELD, ILL., 400 tons of rail steel bars, sewage treating plant, to Laclede Steel Co.

MALDEN, MASS., 100 tons, school, to Joseph T. Ryerson & Son, Inc., Boston.

JERSEY CITY, 150 tons, spirals for factory of American Can Co., to Faitoute Iron & Steel Co.

SPRINGFIELD, ILL., 500 tons, sewage treating plant, to an unnamed bidder.

SPRINGFIELD, MO., 550 tons, Grant Street viaduct, to Laclede Steel Co.

ST. LOUIS, 7700 tons, River Des Peres sewer project, to A. Guthrie & Co., St. Paul, Minn.

WALLA WALLA, WASH., 300 tons, hotel, to Northwest Steel Rolling Mills, Inc.

PORTLAND, ORE., 250 tons, Broadway bridge, to Northwest Steel Rolling Mills, Inc.

CONCRETE, WASH., 125 tons, tanks, for Superior Portland Cement Co., to Northwest Steel Rolling Mills, Inc.

PORT TOWNSEND AND ABERDEEN, WASH., 1500 tons, pulp and paper mills, to Pacific Coast Steel Co.

SACRAMENTO, CAL., 138 tons, for road work near Redlands, to an unnamed company.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEWARK, 800 tons, highway viaduct; readvertised bids on Oct. 17.

SAYRE, PA., 215 tons, high school; bids in.

BROOKLINE, MASS., 300 tons, Cadillac Motor Car Co. sales and service station.

CHICAGO, 1000 tons, West Side sewer.

CHICAGO, tonnage being estimated, apartment hotel at 5000 East End Avenue.

CHICAGO, 350 tons, apartment building at Sixty-seventh Street and Crandon Avenue; Quinn & Christensen, architects.

CHICAGO, tonnage being figured, apartment building at 1350 Astor Street; B.-W. Construction Co., general contractor.

CHICAGO, tonnage estimate being prepared, Y. M. C. A. building at the corner of Lincoln Avenue and Belmont Street.

CHICAGO, 250 tons, McCormick Memorial Y. W. C. A.

CHICAGO, 100 tons, Swedish Covenant Hospital.

CHICAGO, 150 tons, Temple Sholom; Coolidge & Hodgdon, architects.

CHICAGO, 400 tons, Kelly High School.

DESPLAINES, ILL., 130 tons, St. Patrick's Academy.

JANESVILLE, WIS., 690 tons, reservoir.

SPRINGFIELD, MO., 425 tons, Benton Street viaduct.

HOQUIAM, WASH., 1500 tons, pulp and paper mill, for Zellerbach Paper Co., San Francisco.

Railroad Equipment Buying

The Maine Central is inquiring for two baggage and mail cars.

The Chicago, South Shore & South Bend has ordered four 30-ft. steel underframe caboose cars from the American Car & Foundry Co.

The Pacific Electric contemplates buying 10 light interurban passenger cars.

The Seaboard Air Line is having two gas-electric rail motor cars and two trailer coaches built by the St. Louis Car Co.

The Ferrocarril Del Pacifico, Colombia, S. A., has ordered 10 locomotives from the Baldwin Locomotive Works.

The South African Railways have purchased 50 fruit cars from the Cie Centrale de Construction, of Belgium.

The Chicago, Milwaukee & St. Paul will buy 10 baggage cars.

The St. Louis-Southwestern has purchased 10 steel underframes for box cars from the American Car & Foundry Co.

Industrial Finances

Net income of the American Smelting & Refining Co., New York, for the six months ended June 30, was $8,507,944, equivalent to $11.08 a share on the common stock outstanding. This compares with $8,854,855 or $11.65 a share in the corresponding period of 1926.

The Torrington Co., Torrington, Conn., and subsidiaries, for the year ended June 30, 1927, had net profits of $2,117,012, allowing balance to surplus after taxes, dividends and other charges of $352,012. In the preceding fiscal period the company earned $1,855,483, an addition to surplus of $55,733.

The American Chain Co., Bridgeport, Conn., for the six months ended June 30, reports net income of $527,121 after depreciation, interest and other charges, and equivalent to $4.79 a share on $11,000,000 preferred stock. In the first half of 1926 the company earned $600,114.

The Continental Can Co., New York, in the seven months ended July 31, earned $3,440,889, allowing balance to surplus after depreciation and Federal taxes of $2,491,579. This compares with earnings of $3,257,011 in the corresponding seven months of 1926 and balance to surplus of $2,383,412.

Net profits of the A. O. Smith Corporation, Milwaukee, for the year ended July 31, 1927, amounted to $3,656,926, equal after interest, depreciation, taxes and preferred dividends, to $24.78 a share on the 100,000 shares of common stock outstanding. Net earnings of the previous corresponding period were $1,727,299. The directors have recommended an increase in capitalization from 100,000 to 500,000 shares of no par common. The proposal is to be voted on by stockholders Oct. 19.

PERSONAL

Walter Sennhauser, formerly mechanical engineer for Sulzer Brothers, Ltd., Winterthur, Switzerland, arrived in New York Sept. 26 to assume his new duties as chief engineer of the Dry Quenching Equipment Corporation. This company is a new subsidiary of International Combustion Engineering Corporation, New York, and was organized to exploit the recently acquired American rights to patents covering the Sulzer system for dry quenching of coke.

WALTER SENNHAUSER

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John A. Topping, chairman Republic Iron & Steel Co., New York, will act as chairman of the iron and steel group in the 1927 Red Cross roll call which will cover the entire metals and machinery field in New York. F. L. Ward, treasurer Babcock & Wilcox Co., heads the boilers, engines and machinery group; Charles Hayden of Hayden, Stone & Co., is chairman of the mining, smelting, pig iron and brass group, and Samuel B. Donnelly, secretary of the Allied Building Metals Association, will be in charge of the bronze and allied metals group.

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Fred J. Fisher, one of the founders of the Fisher Body Co., Detroit, and Clarence R. Bitting, managing director of the Fisher Co., an affiliated organization, have been invited to become members of the board of the Baldwin Locomotive Works, Philadelphia, and will be duly elected as soon as necessary legal procedure may be completed. The election involved an increase in the membership of the board from 12 to 15, and thus another vacancy is left to be filled.

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Harrison Souder has resigned as general manager of the Bethlehem Mines Corporation, Cornwall division, Lebanon County, Pa., effective Oct. 1. He is at present located at Ridgewood, N. J.

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Elmer E. Bucher has been made assistant vice-president of the Radio Corporation of America, New York. Joseph L. Ray, associated for 23 years with the Western Electric Co. and more recently with the Graybar Co., has been appointed general sales manager of the Radio company.

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Charles E. Shearer, for several years advertising manager for the Industrial Works, Bay City, Mich., has resigned, effective Oct. 20.

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R. Edson Emery, who resigned the presidency of the Superior Steel Corporation, Pittsburgh, July 1, has become associated with the Colonial Steel Co., Pittsburgh, as vice-president. Before going with the Superior corporation in 1922, he had been for 22 years with the Crucible Steel Co. of America in operating capacities. When he left that company he was Pittsburgh district mill manager, in charge of La Belle, Singer-Nimick, Park and Crescent works in Pittsburgh and the Norwalk works, Norwalk, Ohio.

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George A. Richardson, manager of technical publicity, Bethlehem Steel Co., spoke on blast furnace and steel mill practice before the Boston chapter, American Society for Steel Treating, at the Massachusetts Institute of Technology, Cambridge, on Oct. 7.

Charles A. Rowan, vice-president and comptroller of the Westinghouse Air Brake Co., Pittsburgh, has been elected president of the Westinghouse International Brake & Signal Co., which has been organized to take over the Air Brake company's interests abroad. He will retain his position as vice-president of the parent company, but has resigned as comptroller and will be succeeded in that office by T. S. Grubbs, vice-president and treasurer of the Union Switch & Signal Co., Swissvale, Pa.

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G. H. Fobian has been appointed sales manager of the Oilgear Co., Milwaukee, effective Oct. 1.

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Charles C. Phelps is in charge of the New York metropolitan district sales office recently opened at 30 Church Street in that city by the Hill Clutch Machine & Foundry Co., Cleveland.

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Walter Springe, who has represented the Heine Boiler Co., New York, in the Kansas City and St. Louis territory for the past 25 years, has been recently appointed district manager of Combustion Engineering Corporation, in that district. R. J. Robinson has been appointed branch manager under Mr. Springe at St. Louis.

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Gregory J. Comstock, director of research of the Firth-Sterling Steel Co., sailed last week on a six weeks' trip to England, where he will spend some time in the research department of Thomas Firth & Sons, Sheffield, and visit various English and continental steel and cutlery plants.

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George W. Ranger, works manager of the Fairmont Mining Machinery Co., Fairmont, W. Va., has resigned to become general manager of the Pulaski Foundry & Mfg. Corporation, and the Pulaski Engineering Works, Inc., both at Pulaski, Va., manufacturers respectively of cast iron and steel machinery, and of heavy plate and structural steelwork. H. G. Bonham, who has since 1924 been associated with the Mathieson Alkali Works, returns to the Pulaski Foundry & Mfg. Corporation as works manager, succeeding W. E. Ring.

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H. R. Harris, 1123 Metropolitan Life Building, Minneapolis, has been appointed representative in Minnesota and Douglas County, Wis., of the Falk Corporation, Milwaukee, manufacturer of herringbone gears, speed reducers and flexible couplings.

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H. T. Boulden has been appointed manager of the truck division, Pierce-Arrow Motor Car Co., Buffalo. He was one of the founders and at one time president of the National Association of Motor Truck Managers and was for eight years vice-president in charge of sales, service and advertising for the Selden Truck Corporation, Rochester.

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Col. J. Frank Drake, president Standard Steel Car Co., Pittsburgh, and formerly president of the Forged Steel Wheel Co., Elyria, Ohio, has been elected to the board of the American Rolling Mill Co., Middletown, Ohio, succeeding S. M. Goodman, who has resigned.

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S. D. Wallace has been appointed Cleveland district sales manager of the Moltrup Steel Products Co., Beaver Falls, Pa., manufacturer of cold drawn, milled and ground specialties, and will have offices at 409 Union Trust Building. The company was formerly represented in the Cleveland territory by the H. D. Cushman Co., 2100 B. F. Keith Building.

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Jean Achard, of Achard & Co., 146 rue Oberkampf, Paris, France, is spending a few weeks in the United States, studying welding of sheet metal and sheet metal working tools.

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Henry J. Noble, associated since 1910 with the American Cast Iron Pipe Co., Birmingham, and for several years superintendent of its main pipe foundry, has been appointed assistant works manager of the

company. W. J. Bowers has been made superintendent of operations. He has been superintendent of the pattern shop, green sand and special foundries of the company for a number of years. E. M. Cole, traffic manager of the company, has been elected a director.

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Walter B. Zietz, for many years associated with the engineering and sales department of the Newton Machine Tool Works, Philadelphia, and more recently district sales manager in Philadelphia for the Consolidated Machine Tool Corporation of America, has been appointed sales manager of the Jones Machine Tool Works, Inc., Philadelphia.

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E. K. Miller, recently superintendent of the Bessemer, Ala., blast furnaces of the Tennessee Coal, Iron & Railroad Co., has been made superintendent of the company's new furnaces now under construction at Fairfield, Ala. He has been succeeded at Bessemer by G. M. Harris, who has been assistant superintendent of the Bessemer furnaces. J. A. Meissner, assistant superintendent of the company's Alice furnace at Birmingham, has been transferred to Bessemer to succeed Mr. Harris.

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E. A. Muller, president King Machine Tool Co., Cincinnati, and Newell Sanders, Newell Sanders Plow Co., Chattanooga, Tenn., have been elected vice-presidents of the American Society of Mechanical Engineers.

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H. E. Yeager, known in the pig iron business of the Philadelphia district for the past 10 years, has joined the sales force of the Philadelphia district office of the Donner Steel Co., in charge of H. G. Uphouse. Mr. Yeager will handle pig iron sales.

OBITUARY

FREDERICK G. COGGIN, treasurer of the Bovey Auto Heater Co., 3907 Prairie Avenue, Chicago, died Oct. 4. He was graduated from the Massachusetts Institute of Technology in 1895, and soon after became associated with the Calumet & Hecla mining interests. Later he became general superintendent of the Cooper Range Consolidated Co. and afterwards held the same position with the Atlantic Mining Co.

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HARRY N. COVELL, general manager of the Virginia Alberene Corporation, Schuyler, Va., died on May 6, in Charlottesville, Va. He was born in Troy, N. Y., on March 25, 1862, and was graduated from the Sheffield Scientific School of Yale University, New Haven, Conn., in 1883. Shortly thereafter he entered the employ of the Yale & Towne Mfg. Co., Stamford, Conn., where he worked in the machine shop, drafting room, and iron foundry. He became connected with the Lidgerwood Mfg. Co., Brooklyn, N. Y., in September, 1889, as assistant superintendent; in 1897 he was promoted to the position of superintendent, and in 1910 to works manager. He held this position until April, 1925, at which time he joined the Virginia Alberene company. He and the late A. J. Caldwell are regarded as organizers of the National Metal Trades Association, in which Mr. Covell held the position of treasurer, vice-president and president, at various times. He was a member of the administration council of the National Founders Association for five years and a director of the American Mutual Liability Insurance Co. of Boston, since 1917. He was a charter member of the Yale Engineering Society and was one of its past-presidents. In 1914 he was made secretary-treasurer of the American Boiler Manufacturers' Association, which position he held at the time of his death.

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PERCY G. HINKLEY, vice-president of the George W. Moore Co., Chicago, maker of buckets, spiral conveyors, etc., died on Sept. 26.

JOHN STAMBAUGH, a director of the Youngstown Sheet & Tube Co., and prominently identified with the metals industry of the Mahoning Valley for the last 40 years, died at his home in Youngstown on Oct. 6. He had recently suffered a nervous collapse which was attributed largely to his work as chairman of the Stambaugh Auditorium, a $2,000,000 structure which has recently been erected as a gift to the city by his brother, the late Henry H. Stambaugh. The former was born at Girard, Ohio, in 1862 and attended the Greylock Institute, South Williamstown, Mass., and Cornell University, graduating from the latter institution in 1884. From 1885 until 1887 he was chemist for the Youngstown Steel Co., severing that connection to become president and general manager of the William Tod Co., manufacturer of heavy mchinery. In 1900 he became secretary and treasurer of the Youngstown Steel Co. and in 1912, treasurer of the Brier Hill Steel Co. He had been a director of the Sheet & Tube company since its founding and was also a director of the Stambaugh-Thompson Co. and of the Federal Reserve Bank of Cleveland. He was a member of the American Iron and Steel Institute and of numerous civic and social organizations in Youngstown and other cities.

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CHARLES CAMPBELL, president of the Campbell Iron Co., St. Louis, died recently in that city. He was born at Johnstown, N. Y., in 1843, and from 1865 to 1876 was employed in Milwaukee. In 1876 he went to St. Louis and became associated with Waterman Brothers & Co., which later became the Waterman, Campbell Iron Co., and afterward the Campbell Iron Co.

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MAX KRUEGER, founder and chairman of the board of the San Antonio Machine & Supply Co., San Antonio, Tex., died on Sept. 28 at Wiesbaden, Germany, where he was visiting during a tour of Europe. He was born in Germany in 1851 and came to the United States when he was 16 years of age. Following a varied career in the Southwest he settled in San Antonio in 1898 and founded the business from which he retired from active management five years ago.

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JOSEPH W. ALLEN, vice-president and general manager of the Owensboro Wheel Co., Owensboro, Ky., died Sept. 28, following an illness of six months. He was 48 years of age.

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HUGH F. TAYLOR, president Union Wire & Iron Co., Cleveland, died Oct. 1, aged 68 years. He was born in Scotland and organized the company of which he was the head 25 years ago. Previously he was employed for a number of years as foreman for the National Iron & Wire Co., Cleveland.

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WILLIAM BATES, sales manager Superior Screw & Bolt Mfg. Co., Cleveland, was killed Oct. 9 when his automobile was struck by an interurban street car. He was 57 years of age. Before he became affiliated with the Superior company three years ago he was associated for 12 years with the Kirk-Latty Mfg. Co., Cleveland.

Air Furnace Supplements Cupola in German Iron Foundry

A combination of a cupola and an air furnace for use in an iron foundry is a unique development in Germany. A German company is reported to have put into successful use the scheme of utilizing the waste heat of an air furnace to assist in melting the charge in the cupola. The latter is located at one end of the air furnace and the cupola is charged in the usual manner, with the exception that the amount of coke necessary is reduced to some extent. The products of the cupola are allowed to flow into the air furnace, where the iron is said to be brought to a higher temperature than is usual when the cupola alone is the melting medium. The product is claimed also to be more uniform.

Machinery Markets and News of the Works

ACTIVITY MODERATE

Single Tools from Scattered Sources Still Predominate

Farm Implement Manufacturers Make Purchases —Railroad Business Quiet

ORDERS placed during the past week were for the most part for single tools. They were from a wide diversity of sources and the total was not large.

There is a fair volume of inquiry before the trade but how much of this will be carried over into the 1928 budget is problematical.

Purchases have been made by farm implement manufacturers. The J. I. Case Threshing Machine Co., Racine, Wis., is closing its list and the International Harvester Co. has purchased several lathes and shapers, as well as a number of used machines. Formal orders are being issued against the list of the A. O. Smith Corporation, Milwaukee.

Demand from the automotive and railroad industries has been quiet. The New York Central Railroad has several inquiries before the trade, one of which includes a side-head boring mill and three engine lathes. A request for prices on a 32-in. shaper has been made by the Santa Fe.

The Grasselli Dyestuffs Corporation, Grasselli, N. J., closed on its list, which includes lathes, shapers and a number of other machine tools.

It is reported from New England that small tools are selling better.

New York

NEW YORK, Oct. 11.

MACHINE tool buying continues moderately active but business is almost wholly confined to single pieces of equipment. With the exception of the New York Central Railroad, which has several inquiries before the market, including a side-head boring mill, three engine lathes and a buffing machine, the railroads show no interest in purchasing at present.

Manufacturers of airplanes and motors are active buyers of tools. Purchase by the Wright Aeronautical Corporation, Paterson, N. J., of a list of tools last week is denied, although the company has several outstanding inquiries for equipment and has bought a thread milling machine and an automatic lathe. The Fairchild-Kaminez Engine Co., Farmingdale, N. J., has closed on an automatic lathe. Steel fabricating shops and contractors' supply houses are also reported among current purchasers of tools.

A list of several tools was closed last week by the Grasselli Dyestuffs Corporation, Grasselli, N. J., including an engine lathe, shaper, radial drill, milling machine, sensitive drill and wet tool grinder. Among other purchases of the week a Buffalo manufacturer bought a high-speed radial drill; a Hartford manufacturer of typewriters a profiling machine; a Springfield, Mass., electrical company, a jig boring machine; a Detroit motor company, a double-end, automatic centering machine; a Bristol, Conn., manufacturer, a 7 x 32 in. bench lathe; a Youngstown manufacturer, a floor boring machine. The Grand Trunk Railway Co. has closed on a 90-in. driving wheel lathe. A Los Angeles company has purchased a 16-in. x 8-ft. cone head lathe.

Recent purchases of used tools include a 20-in. Barnes drill to a company in Rew, Pa., and a 24-in. Aurora, motor-driven drill, two 24-in. Aurora belt-driven drills, a 42-in. x 17-ft. Pond lathe, a 10-in. Bement slotter and a 25-in. x 18ft. Le Blond lathe, all to a coal company in West Virginia.

The Dexter Folder Co., 28 West Twenty-third Street, New York, manufacturer of paper-folding machines, parts, etc., has awarded a general contract to John Forni, Manuet, N. Y., for a two-story addition to its plant at Pearl River, N. Y., to cost about $35,000. W. E. Truesdell, 5 Beekman Street, New York, is architect and engineer.

The Board of Education, 500 Park Avenue, New York, has plans in progress for a new nine-story school of commerce, with industrial division, at Lexington Avenue and East Twenty-third Street, to cost $1,500,000 with equipment. Thompson, Holmes & Converse, 101 Park Avenue, are architects.

The American Cyanamid Co., 535 Fifth Avenue, New York, manufacturer of industrial and metallurgical chemicals, with main plants at Niagara Falls, N. Y., and Warners, N. J., is disposing of a bond issue of $5,000,000, a portion of the fund to be used for additions and improvements in plants, including installation of new equipment for the production of other affiliated products.

Holmes V. B. Ditmas, 2601 Avenue G, Long Island City, building materials, has acquired property, 200 x 240 ft., on East Sixty-ninth Street, extending to the East Mill Basin, Bergen Beach, as site for a new plant with storage and distributing facilities.

The Long Beach Power Co., Long Beach, N. Y., has concluded negotiations for the purchase of the local municipal electric light and power plant for $1,000,000. Extensions and improvements are planned in this section, including transmission line construction.

The Arntex Co., 133 East Forty-third Street, New York, manufacturer of fireplaces and equipment, has leased property at 418 West Twenty-fifth Street, totaling 12,500 sq. ft., for a new plant and will move to the new location.

The Crystal Ice & Coal Co., 307 Arlington Avenue, Plainfield, N. J., has completed plans for a new ice-manufacturing and storage plant at Somerville, N. J., consisting of four units, each one-story, to cost more than $65,000 with equipment.

The American Can Co., 120 Broadway, New York, has completed plans for a new seven-story plant at Jersey City, N. J., where site was recently acquired. It is estimated to cost about $2,000,000 with machinery. It is understood that the company will remove a portion of its plant at Brooklyn to the new location.

The New York Blue Print Paper Co., 96-102 Reade Street, New York, manufacturer of engineers' and architects' supplies, instruments and equipment and of drafting room furniture, announces the change of its name to the Charles Bruning Co., Inc. Its various subsidiary companies, including the Blue Print Co., Boston; the Architects & Engineers Supply Co., Newark, N. J.; the American Blue Print Papers Co., Chicago, and the recently acquired Rapid Blue Print Co., Los Angeles, will be known under the same name. The business was founded more than 30 years ago as a commercial blue printing establishment, but the introduction and growth of the drafting room furniture and supply department has made the name unsuited to the wide range of products manufactured.

The Paramount Laundry Machinery Corporation, Paramount Building, New York, is being taken over by the United States Laundry Machinery Corporation. The latter company desires to place contracts for the manufacture of its machines and is interested in getting in touch with a factory in the New York vicinity equipped with foundry and machine shop for the manufacture of a flat iron worker.

The Long Island Burglar Alarm Co., Inc., Huntington, N. Y., has been formed to build and install burglar and fire alarm systems in stores, factories and private dwellings. The company has its own factory, but will buy relay wires and other equipment.

The New Jersey Valve & Casting Co., Inc., 224-30 Clay Street, Paterson, N. J., has been organized to manufacture high and low pressure valves, cocks and fittings for steam, water and gas, and brass, bronze, and aluminum castings. It is prepared to receive specifications for these types of work.

The Crane Market

THE volume of new inquiry for overhead and locomotive cranes continues small, but sellers are quoting on a number of single crane inquiries, which should be placed before long. In the Chicago district, the Inland Steel Co., Indiana Harbor, Ind., has asked for prices on a 5-ton, 75-ft. span, 3-motor overhead crane for inside service, either new or used equipment being acceptable. The Department of Public Works, State of New York, opened bids Oct. 4 on three 5-ton, 37-ft. 6-in. span hand power cranes for use on the Barge canal. The lowest bid was submitted by the New Jersey Foundry & Machine Co. Neither the 15-ton overhead crane, nor the 25-ton locomotive crane for the Erie Railroad shops at Hornell, N. Y., have been closed.

Railroad inquiries in the Chicago district include a 10-ton electric crane for Paducah, Ky., under inquiry by the Illinois Central Railroad and a 25-ton freight handling gantry crane for St. Paul, Minn., asked for by the Chicago, Milwaukee, & St. Paul Railroad.

Among recent purchases are:

T. Stewart & Co., Boston, a 25-ton locomotive crane from the Browning Crane Co.

E. J. Hughes, Mineola, N. Y., a 12-ton crawl-tread locomotive crane from the Northwest Engineering Co.

Walter H. Gahagan, 147 Remsen Street, Brooklyn, N. Y., a 10-ton used Koehring crawl-tread locomotive crane from a local contractor.

Boston & Albany Railroad, Boston, two 10-ton gantry cranes, one for Boston and the other for Springfield, Mass., from the Milwaukee Electric Crane & Mfg. Co.

City of Hagerstown, Md., a 25-ton, 45-ft. 7-in. span overhead crane from the Niles Crane Corporation.

Carnegie Steel Co., Pittsburgh, a 20-ton shipping yard crane for the Homestead works from the Morgan Engineering Co.

Stickney, Ill., sanitary district, three electric overhead cranes for a power house from the Whiting Corporation.

The Morse Twist Drill & Machine Co., New Bedford, Mass., has opened a store at 92 Lafayette Street, New York, carrying a complete stock of high speed and carbon drills, cutters, reamers, taps, dies, etc.

Chicago

CHICAGO, Oct. 10.

BOTH sales and new inquiry for machine tools appear to have passed the low point. Farm implement manufacturers, however, are still the heaviest supporters of the market. The J. I. Case Threshing Machine Co., Racine, Wis., is closing its list and the International Harvester Co. has purchased several lathes and shapers, a power hack saw and a number of used machines. The A. O. Smith Corporation, Milwaukee, is issuing formal orders against a list that includes two 23-in. grinders, three radial drills and a number of planers, shapers and millers.

Railroad business is quiet, the only fresh inquiry appearing the past week being a request for prices by the Santa Fe on a 32-in. shaper.

The S. & S. Machine Works, Inc., 4539 West Lake Street, Chicago, is preparing plans for a one-story addition, to cost close to $25,000 with equipment. Melvin A. Nelson, 1722 North California Avenue, is architect.

The Wisconsin Steel Works, 2701 East 106th Street, Chicago, has awarded a general contract to the Kerrison Co., 8027 Muskegon Avenue, for three one-story additions, to cost $75,000, $40,000 and $200,000 respectively.

The Falls Foundry Co., Cedar Falls, Iowa, has filed plans for a one-story addition, 47 x 75 ft.

The Massey Concrete Products Corporation, 2429 Broadway, N. E., Minneapolis, Minn., will rebuild the portion of its plant destroyed by fire Sept. 27, with loss reported in excess of $150,000 including equipment.

The Chicago, Burlington & Quincy Railroad Co., 547 West Jackson Boulevard, Chicago, has authorized an appropriation of $3,000,000 for improvements in its local passenger yards, the fund to be used over a period of 18 months, to include new shops and buildings, reconditioning and inspection structures, new trackage, etc.

George W. Klewer, 5 North La Salle Street, Chicago, architect, is asking bids on a general contract for a one and three-story service, repair and garage building for the Chicago Nash Co., 2000 South Michigan Avenue, to cost $500,000 with equipment.

The W. B. Foshay Co., Minneapolis, Minn., operating electric light and power properties, has concluded negotiations for the purchase of the plant and system of the Northwest Light & Power Co., Wallace, Idaho; Mullan Light Co., Mullan, Idaho; Canyon Light & Water Co., Burke, Idaho; Mission Range Power Co., and the Flathead Valley Electric Co., Polson, Mont. Plans are under way for extensions and betterments in several power plants, and for the construction of new transmission lines. The properties will be operated under the direction of the Public Utilities Consolidated Corporation.

The All-Steel Equipment Co., Aurora, Ill., is reported to be planning the construction of a new one-story machine shop to cost about $23,000 with equipment.

The Limestone Fertilizer Co., care of J. P. Magnussen, Rock Island, Ill., president, is said to be completing plans for a proposed plant on Dalbee Creek, about 15 miles from Burlington, Iowa, to consist of several units, with power house, machine shop and other buildings, to cost more than $400,000 with machinery.

The Davenport Brass Foundry, 617 Harrison Street, Davenport, Iowa, has been incorporated for the purpose of expanding its business in brass, bronze and aluminum castings, copper-lead bearing metals, duralumin street signs and ornamental bronze work. The company is not in the market for additional materials or equipment.

H. D. Conkey & Co., Mendota, Ill., manufacturer of cranes, trolleys, hoists and factory trucks have made the following district representatives: W. C. Minier, 848 Leader News Building, Cleveland; Chatard & Norris, 206 Water Street, Baltimore, and the American Engineering Co., 727 Oliver Building, Pittsburgh.

Cincinnati

CINCINNATI, Oct. 10.

MACHINE tool sales the past week were only fair at best and were limited to single machines from widely diversified sources. While considerable inquiry is pending, buyers are slow in closing for equipment. Production in local plants continues on a restricted basis and indications are that operations will not be increased in the near future.

The Air Corps, Material Division, Wright Field, Dayton, Ohio, is asking bids until Oct. 18 for 30 vacuum pumps, circular 110, and handle assemblies, circular 114; until Oct. 24 for fuel pump drive assemblies, magneto bracket and oil pump assemblies, circular 112, and until Oct. 26, for 40 propeller club assemblies and 40 propeller club disks, circular 115.

The Stomps Sales Co., 504 South Main Street, Dayton, Ohio, automobile agency, has filed plans for a new three-story service, repair and garage building, 100 x 200 ft., to cost about $150,000 with equipment.

The Flye & Hobson Wholesale Co., Memphis, Tenn., has plans for a new two-story cold storage and refrigerating plant, 185 x 218 ft., to cost upward of $225,000 with equipment. J. Frazer Smith and H. M. Burnham, Goodwyn Institute Building, are architects.

The Southern Bakery Equipment & Supply Co., 160 Third Avenue, South Nashville, Tenn., is planning purchase of sugar mill machinery, also mixing equipment for the production of extract powders, baking powder, etc.

The Kentucky Utilities Co., Starks Building, Louisville, has acquired municipal power property at Caneyville, Ky., and plans extensions and improvements in this section, including transmission line construction.

Kruckermeyer & Strong, St. Paul Building, Cincinnati, architects, have plans under way for a five-story and basement automobile service, repair and garage building, 95 x 280 ft., to cost about $250,000 with equipment.

Plans have been filed by the Magnet Knitting Mills, Clinton, Tenn., for a new one-story power house, to cost upward of $70,000 with equipment. The W. E. Biggs Engineering Co., Knoxville, Tenn., is engineer.

The Star Box & Printing Co., Chestnut and Seventeenth Street, Chattanooga, Tenn., is said to be completing plans for the first unit of a new plant for the manufacture of cardboard and paper boxes and cartons, to be about 200 x 250 ft., to cost approximately $100,000 with automatic and other machinery. It is purposed to build additional units later, with ultimate plant to cost more than $300,000.

Cleveland

CLEVELAND, Oct. 10.

FRANK CORELL, 12538 Euclid Avenue, Cleveland, is considering the construction of a new one-story automobile service, repair and garage building, to cost about $100,000 with equipment.

The Herbrand Co., Fremont, Ohio, manufacturer of forgings, etc., has plans for a one-story addition aggregating about 15,000 sq. ft. of floor space, to cost about $35,000 with equipment. The company has arranged to transfer a portion of its East Side works to the new location.

The New York Central Railroad Co., Grand Central Terminal, New York, has plans under way for extensions in its engine house and repair shops on East 152nd Street, Cleveland, to cost about $85,000 with equipment.

The Willys-Overland Co., Toledo, Ohio, manufacturer of automobiles, is completing arrangements to manufacture all body requirements of Overland cars in direct company plants, and will eliminate such work from outside production in the future. Facilities will be provided at Toledo and other plants. It is purposed to arrange for the change by the close of the year.

The Shuer-Hattner Iron & Steel Co., 369 South Erie Street, Toledo, is said to be planning to rebuild the portion of its plant recently destroyed by fire, with loss reported at more than $30,000 with equipment.

The Mansfield Tire & Rubber Co., Mansfield, Ohio, has plans under way for a three-story addition, totaling about 85,000 sq. ft. of floor space to cost in excess of $125,000 with equipment.

Philadelphia

PHILADELPHIA, Oct. 10.

THE Belber Trunk & Bag Co., Twenty-second and Arch Streets, Philadelphia, manufacturer of metal-reinforced trunks, etc., has concluded arrangements for the purchase of the four-story factory at Twenty-fourth and Locust Streets, 135 x 148 ft., for a new plant. Present local factories will be continued in service.

Ware Brothers, 4611 Walnut Street, Philadelphia, operating an automobile business, have filed plans for a new two-story service and repair building, 95 x 120 ft., to cost $100,000 with equipment. Philip S. Tyre, 114 South Fifteenth Street, is architect.

The Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, has taken title to about 33 acres of land in the vicinity of the King of Prussia and Gulph Roads, King of Prussia, Pa., as a site for a proposed power plant, to be used in connection with its recent expansion program and proposed merger with the United Gas Improvement Co.

The Board of Education, Princeton, N. J., is considering the installation of manual training equipment in a proposed new high school to cost about $500,000, for which bids will be asked on a general contract some time this month. Ernest Sibley, Palisade, N. J., is architect.

New interests have acquired the plant and business of the Snyder Chain Co., Hazleton, Pa., manufacturer of conveyor chains and other heavy transmission chains, and will take over the property at once. It is understood that the business will be removed to Springfield, Mass., where it will be continued in operation. Stanley Benner, heretofore manager of the company, will remain with the organization.

The Board of Education, Lock Haven, Pa., is said to be planning the installation of manual training equipment in a new three-story high school, for which bids will be asked on a general contract about Oct. 15. Lawrie, Green & Co., Third and Forster Streets, Harrisburg, Pa., are architects.

The Hostetter-Connellsville Coke Co., Connellsville, Pa., has approved plans for the electrification of the power and pumping department at its Whitney mining proerties at Greensburg, Pa., with installation of additional equipment.

The Lawrence Portland Cement Co., Northampton, Pa., will make improvements in its mill, including the installation of a new dust-collecting system and other equipment, to cost close to $40,000.

The Graham Garage & Supply Co., 234 West Center Street, Mahanoy City, Pa., will soon take bids for a three-story addition to its service and repair works, to cost about $65,000 with equipment. W. H. Lee, 1505 Race Street, Philadelphia, is architect.

The Camden Rail & Harbor Terminal Corporation, Camden, N. J., care of Frederick Cohen, Merchantville, N. J., one of the heads of the company, expects to begin work on its proposed terminal on the site of the former Kaighn Avenue Ferry on the Delaware River, before the close of the month. It will consist of a nine-story ice-manufacturing and cold storage plant, with power house on adjoining site, to cost $2,250,000 with machinery.

The Lehigh Traction Co., Hazleton, Pa., is planning the construction of a new steam-operated electric generating plant, to cost upward of $100,000 with equipment. It will have a capacity for furnishing company requirements, as well as for service for the Wilkes-Barre & Hazleton Railway Co., and a number of coal-mining properties, where transmission lines will be constructed.

The York Ice Machinery Corporation, York, Pa., has been formed by a merger of nine manufacturers of ice, refrigerating and other machinery with a capital of $20,000,000. The companies included in the merger are: The York Mfg. Co., the York Milk Machinery Co. and the York Oil & Chemical Co., all of York; the Shipley Construction & Supply Co., Brooklyn; the Bay State Construction & Supply Co., Boston; the Southern Construction & Supply Co., Atlanta, Ga.; the Greenwood Construction & Supply Co., Pittsburgh; the York-Ohio Ice Machinery Co., Cleveland, and the York Products Co., St. Louis.

The Automatic Nut-Thread Corporation, Buffalo, has taken over a four-story factory building at 3617-19 North Eighth Street, Philadelphia, which it will occupy on Nov. 1 for manufacturing Threadnut automatic nut tapping machines.

Buffalo

BUFFALO, Oct. 10.

CONTRACT has been let by the Packard Motor Car Co., 1580 Grand Boulevard, Detroit, to John W. Cowper, Inc., Fidelity Building, Buffalo, for a one-story addition to its service and repair building at Buffalo, to cost close to $100,000 with equipment. Albert Kahn, Inc., Marquette Building, Detroit, is architect and engineer.

The Brockway Motor Truck Corporation, Cortland, N. Y., has taken title to property, 200 x 200 ft., at White Plains, N. Y., for about $40,000, and will build a new factory branch, service and repair building, to cost upward of $70,000 with equipment. C. W. Clark, Savings Bank Building, Cortland, is architect.

The St. Regis Paper Co., Watertown, N. Y., operating the Oswego Board Corporation, Oswego; the Harrisville Paper Corporation, Harrisville, N. Y., and other subsidiaries, is disposing of a preferred stock issue to total $2,739,900, a portion of the proceeds to be used for expansion.

The Board of Education, High School Building, Niagara Falls, N. Y., is said to be arranging a call for bids for its proposed three-story vocational school, to cost approximately $400,000 with equipment. Kirkpatrick & Cannon, 503 Third Street, are architects; Walter McCulloh, Gluck Building, is consulting engineer. N. F. Herbert Fetch is president of the board.

George F. Crivel & Co., Inc., 614 Ellicott Square, Buffalo, has been appointed representative in the Buffalo territory for the American Foundry Equipment Co., Mishawaka, Ind.

New England

BOSTON, Oct. 10.

MOST local machine tool dealers report little, if any, improvement in sales the past week. Others, however, have booked more orders than in some time, although their business is by no means brisk. More inquiries are reported and a considerable number is under active negotiation which gives every indication of closing this month.

A Worcester company is in the market for a side-head boring mill, a lathe, and three or four other used tools. Aside from this, prospective used tool business is confined to single machines. Sales reported the past week include a profiler to a Hartford plant, a 13-in. Pratt & Whitney lathe to a Vermont shop, a 16-in. lathe, a drill press and a power hack saw to an eastern Massachusetts plant, a jig boring machine to a Rhode Island manufacturer, a used lathe and a used shaper to a shop in Maine, and a miscellaneous lot of small used tools to other New England shops, mostly in or near Boston.

Small tools are selling better than a week ago and indications are that October will be the best month for a long time.

The Atlas Plywood Corporation has purchased a warehouse formerly occupied by the Beaver Mills Corporation, North Adams, Mass., which it will equip for manufacturing purposes. Motors and miscellaneous equipment will be required.

Albert Kahn, Inc., 100 Marquisette Building, Detroit, architect, is taking bids for a two-story and basement auto-

mobile sales and service station at Brookline, Mass., for the Cadillac Motor Car Co.

The Edison Electric Illuminating Co., Boston, is having plans prepared for a substation on Hawkins Street, Boston, for which a crane will be required. Details will be announced later.

George B. Alling & Sons, Winsted, Conn., have sold the machinery, tools, patterns, patents and goodwill of their hairpin manufacturing business to the Star Tin Co., Shelton, Conn., recently merged with the New England Tin Co.

The Crompton & Knowles Loom Works, Inc., Worcester, Mass., has awarded a general contract to the Seneca Engineering Co., Worcester, for a three-story addition to cost about $25,000, exclusive of equipment.

The Hathaway Machinery Co., 25 Elm Street, New Bedford, Mass., has filed plans for a one-story addition to its machine shop, to cost close to $20,000, with equipment.

In connection with the recent merger of the American Nokol Co., 215 North Michigan Avenue, Chicago, and the Aetna Automatic Oil Burner, Inc., Providence, the new company will operate under the first noted name. Plans are being completed for the early removal of the Aetna plant to Chicago, where operations will be concentrated.

William F. Lacey, 52 Mystic Avenue, Medford, Mass., manufacturer of automobile bodies, has awarded a general contract to L. W. Eddy, 141 Milk Street, Boston, for a new one-story plant, to cost about $21,000 with equipment.

The Narragansett Electric Lighting Co., Providence, has acquired a tract of 225 acres between Bristol, R. I., and the east shore of Narragansett Bay, as a site for a proposed steam-operated electric generating plant.

The New Bedford Gas & Edison Light Co., New Bedford, Mass., is planning for a bond issue of $600,000 and note issue in amount of $762,000, a portion of the proceeds to be used for extensions and improvements.

The Providence Automatic Stamping Co., Providence, has leased the O'Connell Building, Marlboro, Mass., for a new plant, and will remove the present works to the new location.

The Firestone Tire & Rubber Co., Akron, Ohio, has completed negotiations for the purchase of the Manomet Mill No. 4, constructed for textile fabric service, and closed for a number of months. The new owner will take early possession and will operate as a branch mill.

The Connecticut Power Co., Hartford, Conn., has authorized an increase in capital to $7,550,000. A stock issue to total about $500,000 will soon be sold, a portion of the fund to be used for expansion, including the acquisition of other properties.

Pittsburgh

PITTSBURGH, Oct. 10.

MACHINE tool business in this district is very slow and dealers who have been following up inquiries quite commonly have the impression that no small part of the pending business will be carried over into the 1928 budget. This is partly based on the experience of the past few years, which is that when buyers do not close by the early part of October against inquiries they are usually held over until after the first of the year. A rather good business is reported in repair parts, which is significant as possibly meaning that many tools are being repaired rather than replaced.

The Chaplin-Fulton Mfg. Co., 36 Penn Avenue, Pittsburgh, manufacturer of brass, bronze, and other metal castings, has awarded a general contract to the Taylor-Meyer Co., Keystone Building, for a three-story addition, to cost about $75,000 with equipment. Bernard H. Prack, Martin Building, is architect and engineer.

The Duquesne Light Co., 435 Sixth Avenue, Pittsburgh, has arranged for a bond issue of $10,000,000, a portion of the fund to be used for extensions and improvements for increased power and transmission facilities.

Byron B. Strand, Bradford, Pa., is at the head of a project to construct and operate a local oil refinery. A company will be formed to carry out the enterprise. The initial unit is reported to cost in excess of $200,000 with equipment.

Officials of the Westinghouse Air Brake Co., Wilmerding, Pa., have formed the Westinghouse International Brake & Signal Co., to take over and operate the foreign plants and interests of the company for the manufacture of railroad air brakes and kindred products. Charles A. Rowan, vice-president of the parent company, has been elected president of the new subsidiary and will sail for Europe on Oct. 15 to develop plans for foreign operations.

The Robinson Knife Co., Barbour Street, Bradford, Pa., is reported to be considering plans for a one-story addition to cost approximately $35,000. The company recently discontinued its branch plant at Cuba, N. Y., removing to the Bradford works, and will concentrate production at the latter location. G. L. Robinson is president.

The Equitable Gas Co., 435 Sixth Avenue, Pittsburgh, a subsidiary of the Philadelphia Co., same address, has concluded arrangements for the purchase of close to 1,000,000 acres of gas-bearing property in eastern Kentucky for about $11,000,000, and will develop a portion of the tract for natural gas supply for the Pittsburgh district. A number of pipe line lines also have been secured, and expansion will be carried out in this branch of production.

The Brockway Machine Bottle Co., Brockway, Pa., is reported to be considering a one-story addition to its plant, to cost in excess of $35,000.

The Elliott Co., Jeannette, Pa., is moving the plant of its subsidiary, the Kerr Turbine Co., from Wellsville, N. Y., to Jeannette and will buy some new machinery to supplement that brought from Wellsville.

The Guarantee Liquid Measure Co., Rochester, Pa., and the Marvel Equipment Co., Cleveland, have been merged under the name of the Fry Equipment Corporation. Both Fry and Marvel units are now being manufactured at the company's new plant in Rochester.

Detroit

DETROIT, Oct. 10.

THE Amesbury Seat Mfg. Co., Amesbury, Mass., manufacturer of hardware for custom automobile bodies, soft metal castings, etc., has acquired the former factories of the Apex Mfg. Co., at Ypsilanti, Mich., and will remodel for a new plant. The Amesbury business will be removed to the new location and operations concentrated at that point.

The Sanitarium Hospital Equipment Co., Battle Creek, Mich., manufacturer of metal furniture, has asked bids on a general contract for a two-story addition, to cost in excess of $100,000 with equipment. M. J. Morehouse, 343 South Dearborn Street, Chicago, is architect.

The Hupp Motor Car Co., East Milwaukee Avenue, Detroit, has awarded a general contract to the Everett Winters Co., 1651 East Grand Boulevard, for an addition to its plant, to cost upward of $85,000 including equipment.

The Tyler Sales Fixture Co., Muskegon Heights, Mich., recently formed to manufacture a line of all-steel display racks and kindred products, has taken over the former plant of the Wolverine Casket Co., and will occupy for a new factory.

The National Pattern & Mfg. Co., 423 Mount Elliott Avenue, Detroit, is said to be planning the purchase of a utility grinder and other equipment.

The Southern Michigan Light & Power Co., Coldwater, Mich., has concluded negotiations for the purchase of the municipal electric light and power plant at Quincy, Mich., and plans extensions and improvements in this section.

The Holland Furniture Co., Holland, Mich., has awarded a general contract without competition to the O. F. Miller Construction Co., Pratt Building, Kalamazoo, Mich., for a three-story addition, to cost about $65,000.

The Briggs Co., Lansing, Mich., manufacturer of brick and tile products, has authorized the rebuilding of the portion of its plant at Grand Ledge, Mich., destroyed by fire several weeks ago, with loss reported at close to $100,000 including machinery.

The Walker Refrigerator Co., Detroit, has negotiations under way with the Board of Commerce, Wyandotte, Mich., for the purchase of local property for the establishment of a new factory. The company is arranging an expansion program and will increase facilities at the proposed new works.

The Aetna Steel Co., Inc., Book Tower, Detroit, has been organized to serve the trade with pickled steel products. Commercial deoxidizing, roller leveling, shearing, galvanizing, and de-galvanizing will also be carried on. When completely equipped the plant will have a capacity for 500 tons daily of single pickled material. Stocks of sheets, strip and structural material will be maintained.

The Summerheat Corporation of America, Dowagiac, Mich., has been organized to succeed the oil burner division of the Beckwith Co., Dowagiac, and is carrying on the business as originally operated by the Beckwith organization. At present burners are being manufactured by contract.

The Eclipse Interchangeable Counterbore Co., Detroit, is completing additions to its factory at 7410 St. Aubin Avenue, which will practically double its floor space and increase its capacity from 50 to 79 per cent.

St. Louis

ST. LOUIS, Oct. 10.

THE Corn Products Refining Co., 17 Battery Place, New York, and South Main Street, Kansas City, Mo., is said to have plans nearing completion for a new sugar refinery at North Kansas City, to have an initial daily output of about 200,000 lb. It is estimated to cost close to $1,000,000 with machinery. The company engineering department is in charge.

The Kansas City Public Service Co., 1500 Grand Avenue, Kansas City, Mo., has superstructure under way for a new one-story equipment construction and repair shop, 77 x 135 ft., to cost about $45,000 with equipment. A. E. Harvey is chief engineer.

Aegerter & Bailey, Railway Exchange Building, St. Louis, architects, have plans for a new one-story automobile service, repair and garage building, 75 x 215 ft., to cost about $90,000 with equipment.

The Empire Refineries, Inc., Bartlesville, Okla., is said to be arranging an expansion and improvement program at its oil refinery at Ponca City, Okla., including the erection of new buildings and installation of additional cracking equipment, boiler equipment, etc. The work is reported to cost more than $850,000.

The Standard Steel Works, Inc., North Kansas City, Mo., has been formed to take over and consolidate the local company of same name and the Sheet Metal Products Co., with works at Seventeenth and Cleveland Streets, Kansas City. Operations will be concentrated at the first noted plant, and the Seventeenth Street works removed to this location, where facilities will be provided for the manufacture of grain blowers and other farm equipment as produced by the Sheet Metal company, in addition to the regular products of the Standard organization, including flour mill equipment, grain elevators, steel dump bodies, etc.

The Nebraska-Buick Auto Co., Howard Street and Nineteenth Avenue, Omaha, Neb., representative for the Buick automobile, is completing plans for a three-story addition to its service, repair and garage building, to cost $100,000 with equipment. J. T. Allen and N. S. Wallace, Brandes Theater Building, are associate architects.

The State Department of Education, Little Rock, Ark., is considering the construction of a new mechanical, agricultural and normal school for negroes at Pine Bluff, replacing present obsolete structures and equipment. A fund of $500,000 will be arranged for the project.

The Common Council, Coleridge, Neb., has rejected bids recently received for a motor-driven pumping unit for the water department, and is expected to ask new bids soon. Dean M. Mohr is clerk.

The Board of Education, Dodge City, Kan., contemplates the installation of manual training equipment in a new two-story high school, to cost $250,000, for which bids will soon be asked on a general contract. Mann & Co., R. W. Building, Hutchinson, Kan., are architects.

The D. H. Braymer Equipment Co., W. O. W. Building, Omaha, Neb., has been appointed representative in Nebraska and western Iowa for the Roller-Smith Co., 233 Broadway, New York, manufacturer of electrical instruments and circuit breakers.

Gulf States

BIRMINGHAM, Oct. 10.

THE International Great Northern Railroad Co., Houston, Tex., is said to be planning extensions and improvements in its engine terminal at Palestine, Tex., including the construction of a new engine house with additional shop and repair facilities, to cost more than $40,000. C. S. Kirkpatrick is chief engineer.

The Central Power & Light Co., San Antonio, Tex., has arranged for a bond issue of $4,000,000, a portion of the proceeds to be used for extensions and improvements in power plants and system, including the acquisition of additional properties.

The Mid-Kansas Oil & Gas Co., Findlay, Ohio, is said to be planning the construction of a new oil refinery in the vicinity of Del Rio, Tex., to cost close to $175,000 with equipment.

The Totten Veneer & Lumber Co., McComb, Miss., contemplates the early rebuilding of the portion of its plant recently destroyed by fire with loss reported upward of $100,000 including machinery.

The Shelor Motor Co., Houston, Tex., has leased a three-story building, 120 x 126 ft., now in course of erection by Walter H. Waine, Esperson Building, and associates, to cost about $140,000, of which more than $20,000 will be expended for equipment. Hedrick & Gottlieb, Inc., Post-Despatch Building, are architects.

The Didion Foundry & Machine Works, 3910 Clark Street, Houston, Tex., contemplates rebuilding the portion of its plant recently destroyed by fire, with loss reported at close to $10,000.

The Motoramp Garage, Inc., 215 North Alamo Street, San Antonio, Tex., A. O. McCracken, Jr., head, has tentative plans under way for a multi-story service, repair and garage building, to cost about $130,000 with equipment.

The Peoples Gas & Fuel Co., Inc., Shreveport, La., operating natural gas properties, pipe lines, etc., is disposing of a bond issue of $1,000,000, a portion of the proceeds to be used for expansion. The company is under the direction of the Northwest Louisiana Gas Co.

The Ox Fibre Brush Co., 522 Fifth Avenue, New York, has approved plans for a new plant at De Land, Fla., for the production of raw fiber. It is purposed to build a group of about 10 plant units, for which superstructure on the first two will begin at once. The entire project is reported to cost more than $100,000 with machinery.

The Vermont Marble Co. of Texas, Inc., Bing Building, Houston, has awarded a general contract to the Southwestern Construction Co., West Building, for a one-story mill, 60 x 86 ft., for finishing and polishing.

The Equitable Equipment Co., 410 Camp Street, New Orleans, has inquiries out for a 50-kw. generator, direct-connected to steam engine of vertical type, generating unit to be 3-phase, 60-cycle, 340-volt, complete with exciter, panel, etc.

The Southeastern Ice & Cold Storage Co., Chattanooga, Tenn., has concluded arrangements for the purchase of property at Indiantown, Fla., as a site for a new one-story ice-manufacturing plant, to cost in excess of $45,000 including equipment.

The H. A. Miles Mfg. Co., F. J. Holmes Building, Fort Worth, Tex., manufacturer of stoves, gas heaters and other heating equipment, has awarded a general contract to W. W. Graham, 3433 Avenue M, for a new one-story plant, 75 x 100 ft., to cost approximately $30,000 with equipment.

The Birmingham office of the Robert W. Hunt Co., Chicago, engineers, is now located in the Bankers Bond Building.

South Atlantic States

BALTIMORE, Oct. 10.

THE Pennsylvania Railroad Co., Broad Street Station, Philadelphia, has approved plans for a terminal project in the Little Creek section, Norfolk, Va., including yards, terminal buildings, etc., with elevating, conveying and other freight-handling machinery. The entire project is reported to cost close to $3,000,000 with equipment.

The Wilson-Nash Co., Remington Avenue and Twenty-ninth Street, Baltimore, representative for the Nash automobile, is completing plans for a three-story addition to its service, repair and sales building, to cost close to $90,000 with equipment. Owens & Sisco, Continental Building, are architects. J. O. Beatty is secretary.

The Capital Boat Works, Inc., 714 K Street, S. W., Washington, Wesley Werback, Jr., president and general manager, is reported to be considering the establishment of a new plant for the production and repair of boats and other light craft.

The Eastern Shore Public Service Co., Salisbury, Md., formerly known as the Eastern Shore Electric Co., has arranged for a bond issue of $3,300,000, a portion of the fund to be used for expansion. The company has begun the construction of a new steam-operated electric generating plant at Vienna, Md., to cost close to $1,000,000 with transmission system. The organization is under the management of Day & Zimmerman, Inc., Sixteenth and Walnut Street, Philadelphia, engineers.

The Radiator Specialty Co., 311 East Fifth Street, Charlotte, N. C., has arranged for a lease of property at the site of the proposed local commercial airport to be established by the Chamber of Commerce, and is said to be planning the operation of a service and repair works at that location.

The General Motors Corporation, Detroit, has acquired a tract of about 31½ acres at Atlanta, Ga., as a site for a new assembling and body-building plant for its Chevrolet division. Plans will be drawn at once for four one-story units, 350 x 800 ft., to be used for the main assembly plant; 120 x 200 ft., for parts department; 160 x 680 ft., for the manufacture of Fisher bodies; and 40 x 200 ft., for office and operating service. It is expected to provide facilities for a capacity of 350 complete cars per day. The project is scheduled for completion early next spring and is estimated to cost more than $2,500,000.

The Wallace Co., Wallaceton, Va., George T. Wallace, head, is said to be planning the early purchase of a number

of wood-working tools for the production of finished wood novelties.

The Mountain City Foundry & Machine Works, Academy Street, Greenville, S. C., has concluded negotiations for the purchase of the Standard Iron Works, Spartanburg, S. C., and will take over the property at once. Operations will be continued as a branch plant under the name of the purchasing company.

The Southern Cities Utilities Co., 1612 Market Street, Philadelphia, has been granted permission to acquire the plant and property of the Citizens' Gas Co., Salisbury, Md., and will take over at once. Plans are under way for extensions and improvements.

Bids are being asked by the Bureau of Yards and Docks, Navy Department, Washington, until Oct. 26 for motor-generator sets, switchboard equipment, etc., for the Brooklyn, N. Y., and Puget Sound navy yards.

The General Garage Mfg. Co., 1912 North Charles Street, Baltimore, manufacturer of sheet metal garages, etc., has taken bids on a general contract for a one-story plant, 50 x 75 ft., with sheet-metal working equipment. Porter Bond, 214 North Linwood Avenue, is architect.

Arthur Blatchley, care of Thomas Mullan, Union Avenue, Baltimore, has plans for a one-story and basement automobile service, repair and garage building, 100 x 110 ft., to cost about $100,000 with equipment.

Indiana

INDIANAPOLIS, Oct. 10.

BIDS will soon be asked by the United States Corrugated Fibre Box Co., 1315 Martindale Avenue, Indianapolis, for a new one-story plant, 125 x 300 ft., at Dayton, Ohio, to cost more than $100,000 with equipment. Charles E. Bacon, Odd Fellows Building, Indianapolis, is architect.

The Ames Shovel & Tool Co., Anderson, Ind., has awarded a general contract to B. F. Wright, 228 West Seventh Street, for extensions and improvements in one of its plant units, to cost about $24,000.

The Humphrey-McLemore Lumber Co., New Albany, Ind., is reported planning the erection of a new one-story hardwood finishing mill at Montgomery, Ala., where site has been selected. It is proposed to remove the business at New Albany to the new location. The project will cost upward of $150,000.

The Insley Mfg. Co., 801 North Olney Street, Indianapolis, manufacturer of excavating machinery and other heavy mechanical equipment, will proceed with erection of a one-story addition, to cost about $35,000.

The Warner Gear Co., Muncie, Ind., is disposing of a stock issue to total $1,995,000, a portion of the proceeds to be used for expansion.

The General Electric Co., South Broadway, Fort Wayne, Ind., has plans under way for a one-story addition, to cost in excess of $50,000 with equipment.

The Orin Welsh Aircraft Co, Anderson, has been organized to manufacture airplanes and deal in airplane parts. The Anderson Chamber of Commerce plans to build a Class A airport, to be equipped with steel hangars, and lighted for night flying.

Pacific Coast

SAN FRANCISCO, Oct. 5.

BIDS will be asked on a general contract before the close of the month by Curlett & Beelman, Union Bank Building, Los Angeles, architects, for initial units of the plant to be erected by the Firestone Tire & Rubber Co., Akron, Ohio, at Manchester Avenue and Alameda Street, consisting of a main two-story factory, 380 x 425 ft.; mechanical building, 80 x 100 ft.; four-story warehouse and factory unit, 100 x 380 ft.; power house, 103 x 113 ft.; and two-story office, 50 x 260 ft. The entire project will cost in excess of $2,500,000 with machinery.

The National Ice Co., Lankershim, near Los Angeles, has plans under way for a new ice-manufacturing plant in the North Hollywood district, to cost about $150,000 with machinery.

The United States Gypsum Co., 205 West Monroe Street, Chicago, is said to be planning the construction of a new plant at Midland, Cal., for the production of raw material and finished building products for the Pacific Coast districts, to cost upward of $250,000 with equipment.

The Saginaw Shingle Co., Blaine, Wash., has authorized plans for rebuilding its mill recently destroyed by fire, with loss reported in excess of $100,000 including machinery.

The City Council, Buhl, Idaho, is said to be completing plans for a bond issue of $85,000, the fund to be used for the construction of a municipal electric light and power plant. C. G. A. Divelbiss is city clerk.

The Adams Pipe Works, 2027 Bay Street, Los Angeles, has plans for a new one-story plant, 40 x 175 ft., to cost close to $20,000 with equipment. Cramer & Wise, 124 West Fourth Stret, are architects.

The Southern Pacific Railroad, 65 Market Street, San Francisco, has plans nearing completion for a new one-story machine and repair shop, at Eugene, Ore., to cost in excess of $175,000 with equipment. A one-story storage and distributing building, to cost approximately $25,000, will also be built. The engineering department of the company is in charge.

The Pacific Abrasive Supply Co., 318 Mission Street, San Francisco, has plans for a new two-story works, to cost about $21,000 with equipment. A portion of the structure will be used for storage and distribution. C. J. Hjul, 128 Russ Street, is engineer.

The Union Ice Co., Los Angeles, is reported to be planning the construction of a new one-story ice-manufacturing plant at Los Banos, Cal., to cost more than $45,000 with machinery.

Foreign

THE Municipal Council, Montevideo, Uruguay, has received and appropriation of about $100,000 from the Argentine Congress, the fund to be used in connection with a proposed municipal cold storage and refrigerating plant. Plans will be drawn soon. The entire project will cost in excess of the amount noted, the remainder of the fund to be furnished by the municipality. The American Consulate, Montevideo, Clarence C. Brooks, commercial attaché, has information regarding the enterprise.

The Allgemeine Elektricitats-Gesellschaft (German General Electric Co.), Berlin, Germany, has approved an increase in capital stock of 30,000,000 reichsmarks (about $7,000,000), a portion of the proceeds to be used for expansion. A portion of the new issue will be sold in the United States.

The American & Foreign Power Co., an interest of the Electric Bond & Share Co., 2 Rector Street, New York, is closing negotiations for the purchase of power and light properties in Brazil, Colombia, France and Japan, with aggregate cost of $36,417,597, and will take over closely following its annual meeting on Oct. 18. The Brazilian acquisitions include utilities at Petropolis, Nictheroy, Bahia, Victoria and in the State of Sao Paulo; the Colombian properties are situated at Barranquilla and vicinity. The purchasing company plans extensions and improvements in the different plants, and the installation of additional equipment.

The State Railway Administration, Buenos Aires, Argentina, has been authorized to ask bids for the construction of a railroad line from San Juan to Jachal, Province of San Juan, about 180 kilometers (approximately 288 miles), to cost 15,000,000 paper pesos (about $6,300,000). The American Consulate, Buenos Aires, Philander Cable, Charge d'Affaires, has information regarding the project.

The Automatic & Electric Furnaces, Ltd., London, has removed its offices and works to larger premises on North Road, Holloway, London.

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